ORDER NO. VRD8701201

Service Manual

Portable Video Cassette Recorder

National/Panasonic

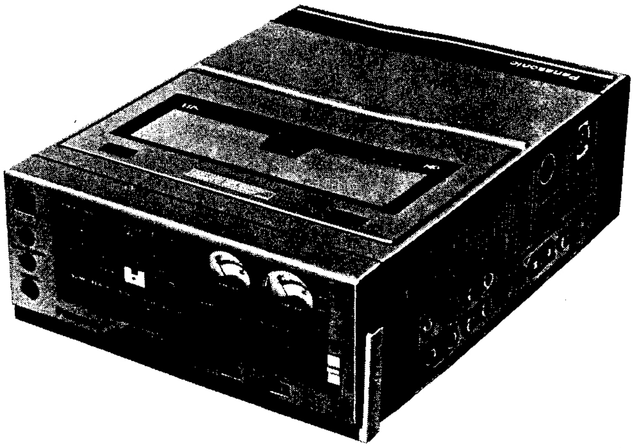
Professional/Industrial Video

VHS Hi-Fi

PAL

AG-6400-E -B -EN

Operating Instructions
Circuit Descriptions
Electrical Adjustment Procedures
Mechanical Adjustment Procedures
Block Diagrams
Schematic Diagrams
Circuit Board Diagrams
Exploded Views
Replacement Parts Lists



SPECIFICATIONS

ITEM	SPECIFICATION
Power	Source: DC 10.5V~16V
	Consumption: Approx 14 watts (41 watts with Camera)
Video	Head: 4 rotary heads, helical scanning system
	Luminance: FM azimuth recording
	Colour signal: Converted subcarrier phase shift recording
	Input Level: VIDEO IN (BNC) 1.0 Vp-p 75Ω unbalanced CAMERA (10 Pin) 1 Vp-p 75Ω unbalanced Output Level: VIDEO OUT (BNC) 1.0 Vp-p 75Ω unbalanced CAMERA (10 Pin) 1 Vp-p 75Ω unbalanced Signal-to-Noise Ratio: 43 dB Horizontal Resolution: Colour: 250 lines
Audio	Head: Normal Audio/Control: 1 stationary head HD Audio: 2 rotary heads Erase: 1 full track erase 1 audio track erase
	Track: 2 track (Normal-stereo), 2 channels (HD sound-stereo)
	Input Level: AUDIO IN (phono × 2): more than −10 dBV 47 kΩ unbalanced MIC IN (1/4" phone × 2): −73 dBV 600Ω unbalanced CAMERA (10 Pin) more than −20 dB, 47 kΩ unbalanced

ITEM	SPECIFICATION
Audio	Output Level: AUDIO OUT (phono × 2): −8 dBV 600Ω unbalanced HEADPHONES: −50 dBV~−20 dBV 8Ω
	Frequency Response: Normal: 50 Hz~10 kHz HD Sound: 20 Hz~20 kHz
	Dynamic Range: 80 dBV (HD Sound)
	Signal-to-Noise Ratio: 50 dB (Normal: Dolby ON)
Time Code	Input Level: (Phono) 1 Vp-p, 56 kΩ unbalanced
	Output Level: (Phono) 0.2 Vp-p, 5600Ω unbalanced
Television System	CCIR Standard (625 lines, 50 fields) PAL Colour Signal
Tape Speed	23.39 mm/sec Record/Playback Time: 180 min. with NV-E180 FF/REW Time: Approx 4.5 min. with NV-E180
Tape Format	Tape width 1/2" (12.7 mm) high density tape
Operating Condition	32° F (0° C)~104° F (40° C) (Temperature) 35%~85% (Humidity)
Dimention	8-23/32" (W) × 3-17/32" (H) × 10-21/32" (D) (222(W) mm × 90(H) mm × 270(D) mm)
Weight	6.6 lbs. (3.0 kg) (without internal battery pack)

Specifications are subject to change without notice.
Weight and dimensions shown are approximate.

National/Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

INTRODUCTION

This Service Manual contains all the technical information which allows service personnels to understand and service the National/Panasonic PAL VHS Video cassette recorder model AG-6400-E/B/EN.
The AG-6400-E/B/EN has many special features as described later.
Added to the basic VHS format, these features make the AG-6400 an ideal unit for business, eduction, entertament, sales and training applications.

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This apparatus was produced to BS 800:1983.
Dieses Modell entspricht der EG-Vorschrift (für Funkstörungsschutz) 82/499/EG.
La Société PANASONIC-FRANCE, importateur du matériel MATSUSHITA-JAPON déclare que cet appareil est conforme aux prescriptions de la directive 76/889/C.E.E. modifiée par la directive 82/499/C.E.E.
Dit model is onderworpen aan de EEG-richtlijn (ter voorkoming van radio-interferentie) 82/499/EEG.
Denne model opfylder EF direktiv 82/499/EF (for forebyggelse af radiointerferens).
La Società PANASONIC ITALIA S.p.A., importatrice di questo prodotto, dichiara che questo apparecchio è conforme alle disposizioni della direttiva C.E.E./82/499 (D.M. 10 aprila 1984).

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

- This unit is designed only for Standard Play (3-hour) mode.
- The video playback system of AG-6400 uses a simplified circuit. It is recommended to use AG-6500 for playing the tape recorded by this unit.
- Take care not to give shocks or rolling to the unit (AG-6400) during recording. Otherwise, the playback picture will roll side to side.
- Some colour beat appears in the playback picture at the joint between cuts of the pictures recorded by the camera connected to this unit (AG-6400).
  To eliminate such colour beat, it is recommended to employ the electronic editing machine AG-6500.

▨ is the Safety Information.

WARNING: Unauthorized recording of copyrighted television programs, films, video tapes and other materials may infringe on the rights of copyright owners and be contrary to copyright laws.

Bescheinigung des Herstellers/Importeurs
Hiermit wird bescheinigt, daß der/die/das
PANASONIC AG-6400-E
(Gerät. Typ. Bezeichnung),
in Übereinstimmung mit den Bestimmungen der
Vfg 1046/1984, 82/499EWG
(Amtsblattveriugung)
funk-entstört ist.
Der Deutschen Bundesport wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.
PANASONIC DEUTSCHLAND GMBH
Name des Herstellers/Importeurs

Inspection

CAUTION:
TO PREVENT FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

Optional Accessories

- Carrying Case, AG-H640
- Video Cassette Tape
- Video Camera, WVP-F10/ WV-V3
- AC Adaptor, AG-B640
- Battery Pack, VW-VB30E
- Car Battery Cord, NV-C450
- Wired Remote Controller, VW-R17E

Features

High Quality Picture

The tape speed is fixed to the standard mode of the VHS standard, and a wide 49 μm video head is used. Also, various technologies have been utilized to obtain a clear and detailed picture. For example, the white clip has been raised 20% (our model's comparison) and a detail enhancer is employed. As a result, this video recorder exhibits a high level of performance.

Hi-Fi Sound

A 4-channel system consisting of normal audio (2 channels) with a Dolby* NR System and HD sound (2 channels) enables you to enjoy high quality live recordings. Also, you can connect 1/4" Phone jack microphone and easily adjust the input levels of CH1 and CH2 independently by observing the respective meters.

Framing Servo

A framing servo circuit which aligns the phase of both odd and even numbered fields of the video signals with that of the two video heads on the cylinder enables framing error to be eliminated when editing using a VHS standard editor. As a result, picture disturbance at the editing points is prevented.

Large Capacity Power Supply Circuit

You can connect a 27W commercial 3-tube color camera to the unit. The range of camera selection is thus widened.

External Power Supply Input Terminals for Commercial Applications (4P-XLR connector)

You can of course connect this terminal to an optional AC Adaptor AG-B640, and also to a commercial specifications AC Adaptor.

Time Code Recording and Playback terminal

By connecting an EBU time code generator to this terminal, you can record time code signals on the normal audio CH2. By connecting time code reader to this terminal, you can play back time code recorded on the tape.

Remote Control Facility

All functions of the recorder can be controlled using the VW-R17E remote controller (optional) except audio dubbing and cassette ejection. This remote control is particularly useful when the AG-6400 is operated by the cameraperson.

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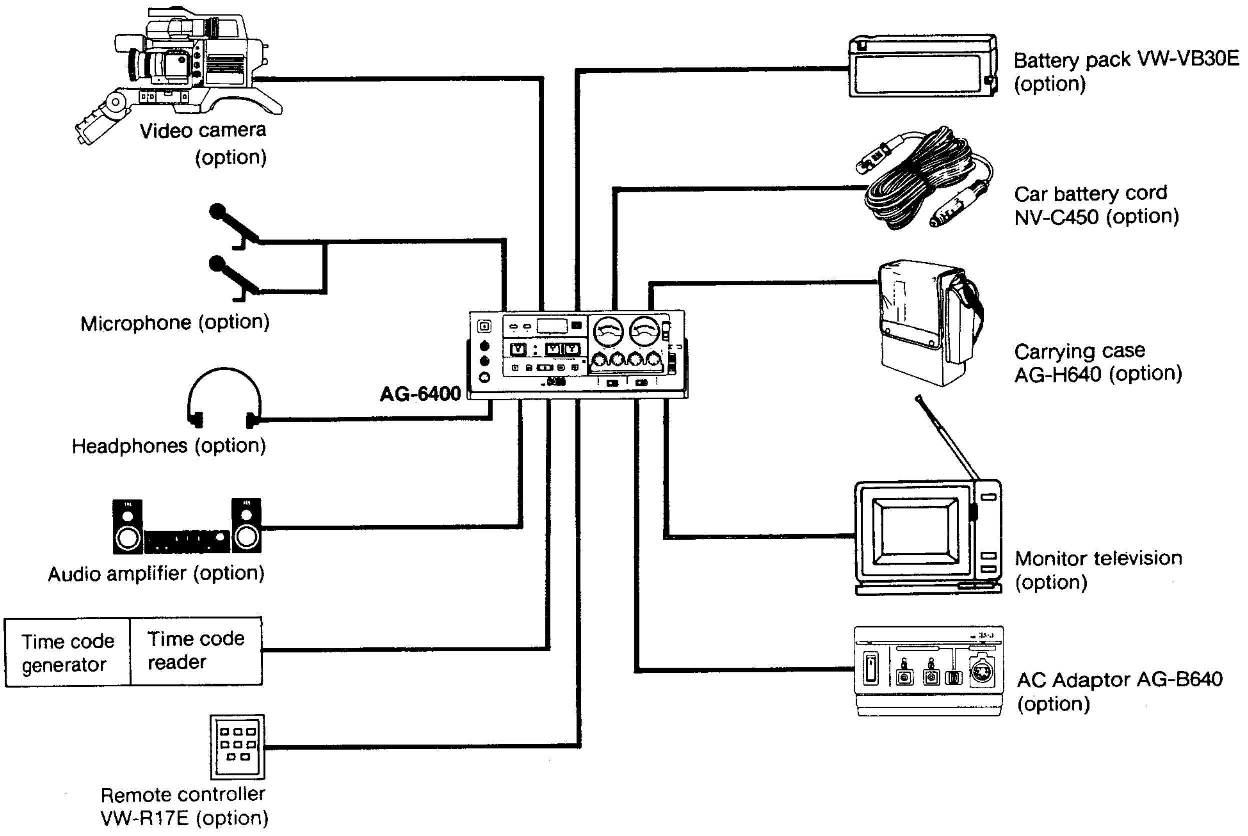
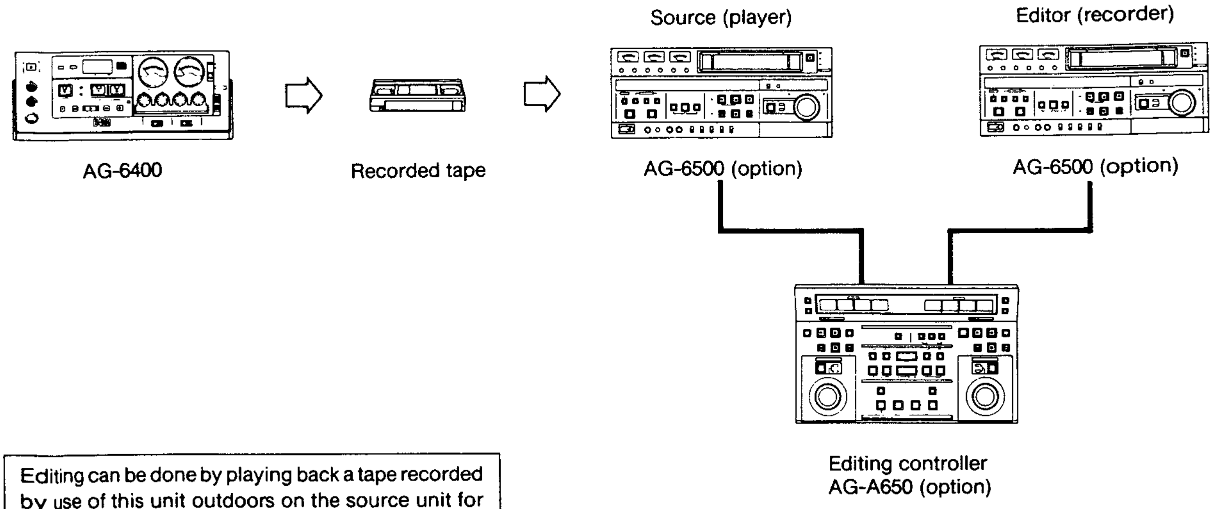
* 'Dolby' and the double-D symbol are trademarks of Dolby Laboratoriies Licensing Corporation.
* Noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.

System Outline

Portable System


Video camera (option)
Microphone (option)
Headphones (option)
Audio amplifier (option)
Time code generator
Time code reader
Remote controller VW-R17E (option)
AG-6400
Battery pack VW-VB30E (option)
Car battery cord NV-C450 (option)
Carrying case AG-H640 (option)
Monitor television (option)
AC Adaptor AG-B640 (option)

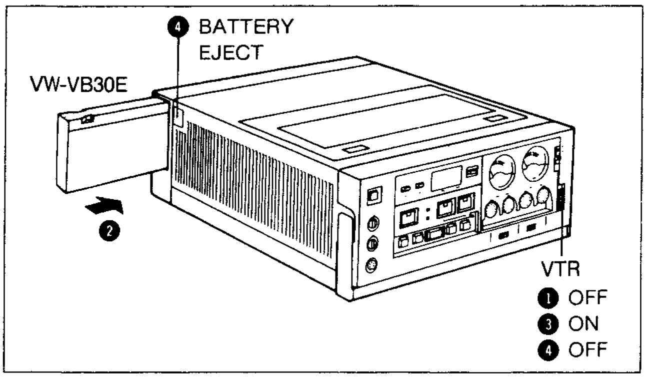
Editing System


Source (player)
Editor (recorder)
AG-6400
Recorded tape
AG-6500 (option)
AG-6500 (option)
Editing controller AG-A650 (option)

Editing can be done by playing back a tape recorded by use of this unit outdoors on the source unit for VHS editing system (AG-6500).

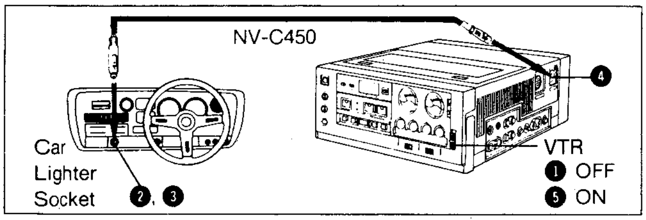
Power Supply

OUTDOOR Battery Pack (option)



① Verify that the VTR switch is OFF.
② Insert the battery as indicated by the arrow. (Push it in firmly until it locks in place.)
③ Turn the VTR switch ON.
④ Before removing the battery, turn the VTR switch OFF, then press the Battery Eject button. The battery will be released, enabling you to remove it.

OUTDOOR Car Battery Cord (option)

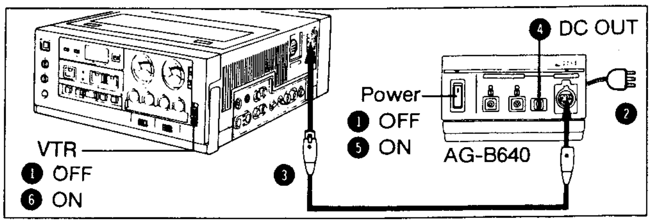


① Verify that the VTR switch is OFF.
② Remove the lighter from the car lighter socket.
③ Start the engine and insert the lighter plug of the car battery cord into the car lighter socket.
④ Insert the adaptor (4P) side of the car battery cord into the External DC Input connector.
⑤ Turn ON the VTR switch of the unit. Use the unit while the engine is running.

After using the unit, turn OFF the VTR switch, then first disconnect the recorder side of the car battery cord followed by the lighter plug.

- You can only run this unit from a car which has a DC 12V negative chassis ground battery connection.
  Under no circumstances run it from a car which has a 24V battery or a positive earth.
- If the battery voltage drops, the internal power supply of the unit will automatically be turned OFF to protect the unit, and also the Auto OFF lamp will flicker. In this case, wait for about 10 seconds, then switch the unit ON again.
- Be sure to start the car's engine before inserting the car lighter plug into the car lighter socket.

INDOOR AC Adaptor (option)

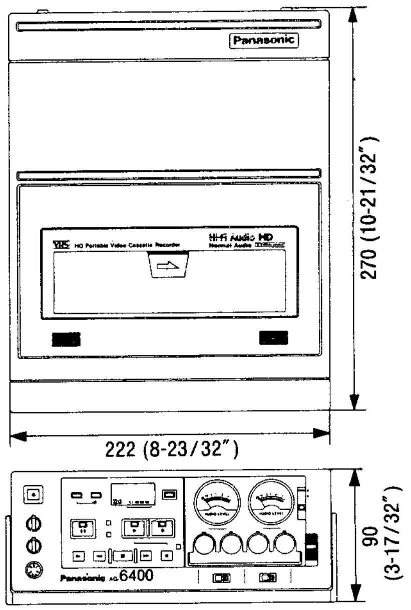


① Verify that the VTR switch of the unit and also the Power switch of the AC Adaptor are OFF.
② Connect the power cord of the AC Adaptor to an AC power outlet.
③ Using the DC cable provided with the AC Adaptor, connect the DC Output connector on the AC Adaptor to the External DC Input connector of the unit.
④ Set the Mode Selector switch of the AC Adaptor to DC OUT.
⑤ Turn ON the Power switch of the AC Adaptor.
⑥ Turn ON the VTR switch of the unit.

- For details, refer to the instruction manual of the AC Adaptor.

Be sure that the power cannot be supplied to the unit while AC Adaptor is charging the Battery Pack.

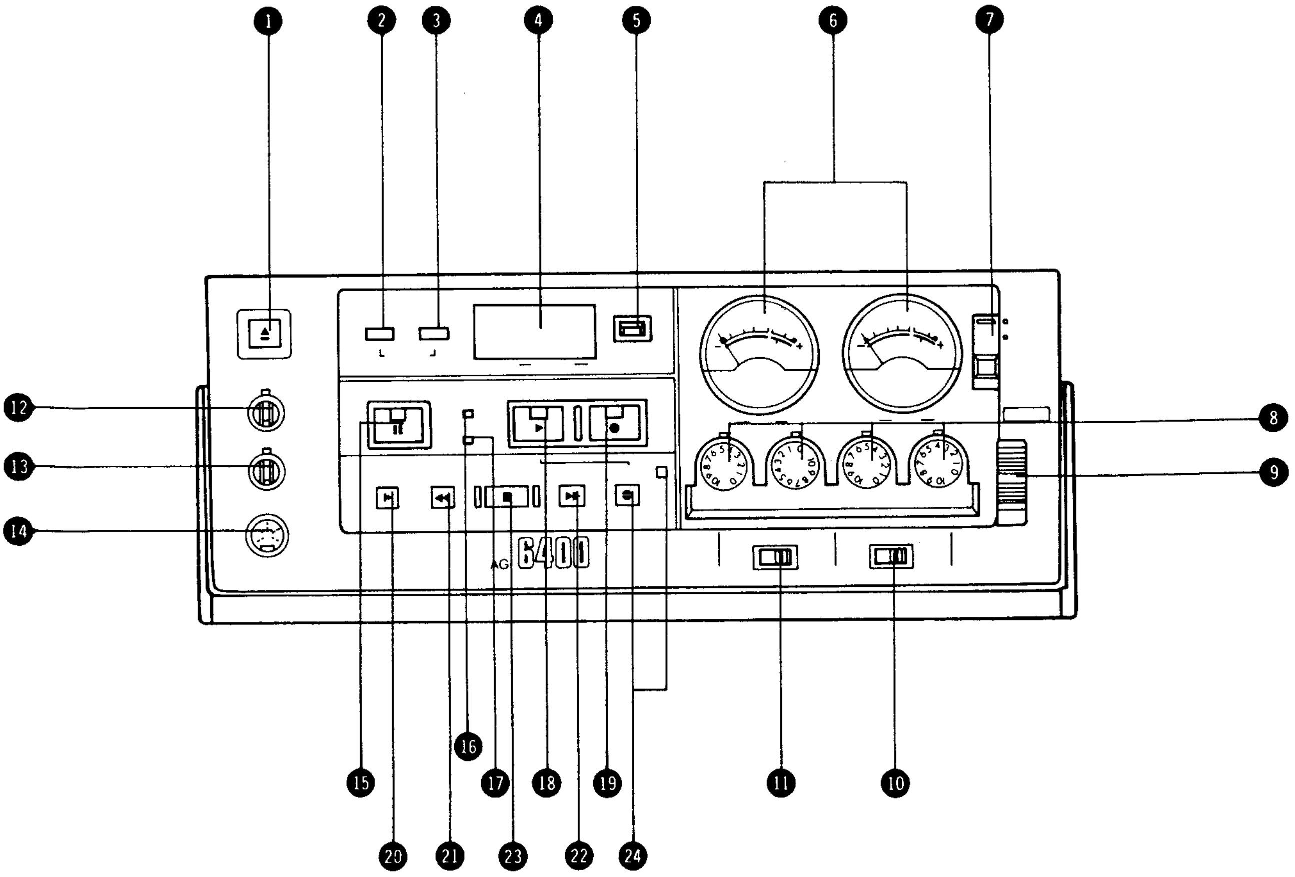
Dimensions


Panasonic
270 (10-21/32")
222 (8-23/32")
90 (3-17/32")
Panasonic AG 6400

Controls and Connectors

unit: mm (inch)

FRONT PANEL


1
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24
AG 6400

① Eject Button

② Memory Button

③ Reset Button

④ Counter Display

⑤ Light

⑥ Audio Level Meters for CH1 and CH2

⑦ Audio Selector Switch
This switch is used to select HD Sound (Hi Fi) or Normal Audio for the output from Audio output jack and to check the input level of HD Sound (Hi Fi) and Normal Audio signals.

⑧ Audio Level Controls for CH1 and CH2

⑨ VTR Switch

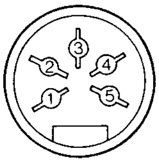
⑩ Normal Audio Limiter Switch (operates only for normal audio)

⑪ Camera Remote Control Switch
By setting this switch to ON when the video recorder is connected to a video camera provided with a remote control function, you can operate the video recorder from the camera.

⑫ Tracking Control (for normal playback)

⑬ Slow Tracking Control (for slow motion playback)

⑭ Remote Control Connector
This connector is used when an optional remote controller VW-R17E is connected to the unit.



5-pin connector

Pin	Contents
1	—
2	Serial data (2)
3	GND
4	Serial clock
5	+5V

⑮ Pause/Still Button

⑯ Auto OFF/Tape End LED
If the tape cannot travel bacause of condensation or for some other reason, this LED will flicker or glow steadily. If you are using a video camera, the LED will flicker when the tape end is reached and the tape cannot be rewound to the beginning.

⑰ Dolby NR Lamp

⑱ Play Button

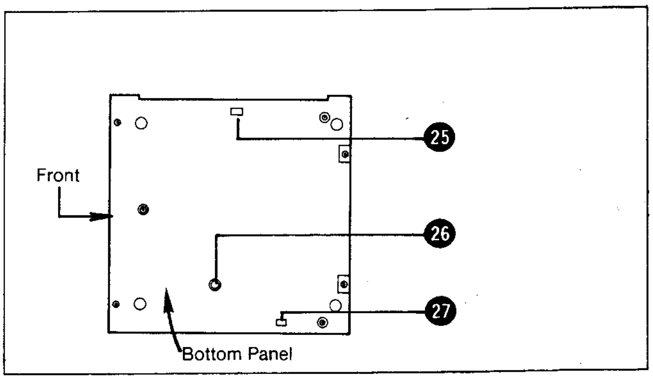
⑲ Record Button

⑳ Slow Button
If you press this button during playback, the tape speed will fall to about 1/4th of normal speed.
If you press this button during a still picture, a frame will be fed each time you press the button. If you keep it pressed, the tape will travel at about 1/14th of normal speed.
To cancel slow speed operation, press the Play button; normal playback will be resumed.

㉑ Rewind and ㉒ Fast Forward Buttons
If you press either of these buttons while the unit is in the Stop mode, the unit will go into the E-E mode and rewind or fast forward will take place.
By pressing this button during playback, the playback picture will become about 7 times normal speed in the reverse/forward direction.

㉓ Stop Button

㉔ Audio Dubbing Button/Lamp
If you press this button together with the Play button, audio dubbing will take place on normal audio CH2 only, and the Play lamp and also the lamp at the top right of this button will light.
To stop the audio dubbing, press the Stop button.

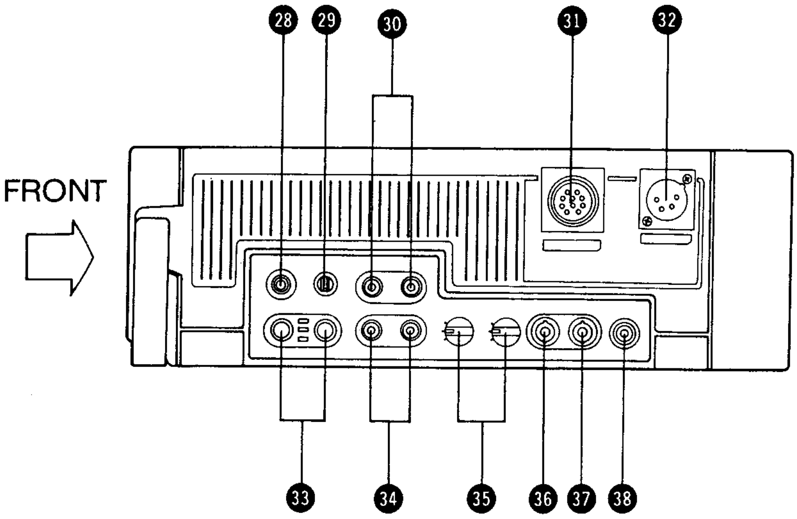


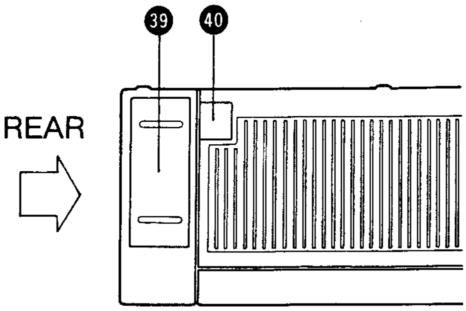
㉕ Camera EXT Audio In Switch
By setting this switch, the stereo recording can be done with the camera's microphone and separate audio input (external microphone or audio input).

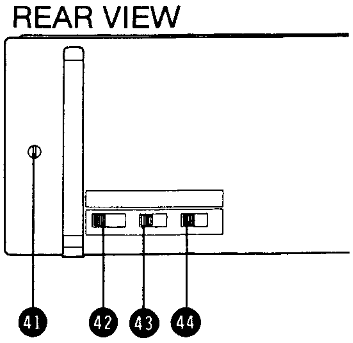
㉖ V-Lock Control
Adjust this control to minimize the jitter in the still picture.

㉗ Frame Servo Switch
By setting this switch, frame servo circuit can be turned on and off.

SIDE PANEL







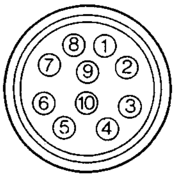
㉘ Headphone Jack

㉙ Headphone Level Control

㉚ Audio Output Jacks for CH1 and CH2

㉛ Camera Connector (10-pin connector)

Connect a video camera to the unit using a 10-pin camera cable. This connector takes priority to the Video Input connector.

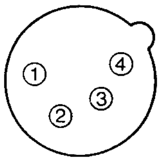


10-pin connector

Pin	Contents
1	Video Input/Output
2	GND
3	Serial Data (1)
4	Serial Clock (1)/Tally
5	Standby (H) Input/ Audio CH2 input
6	Camera Pause (L) Input
7	Audio CH1 Input
8	GND
9	GND
10	+12V Output (Camera power supply)

㉜ External DC Input Connector

Connect this connector to AC Adaptor AG-B640 (option). This connector takes priority to Battery Pack.



4-pin XLR connector

Pin	Contents
1	GND
2	—
3	—
4	+12V

㉝ Microphone Jacks CH1 and CH2

Use these jacks when connecting microphones.
(1/4" Phone jack)

- •If you connect only one microphone to either CH1 or CH2, you can record on both channels.
- •For audio dubbing, use CH2.

㉞ Audio Input Jacks (Phono Jacks) for CH1 and CH2

- •If you connect an audio input to only CH1 or CH2, you can record on both channels.
- •For audio dubbing, use audio CH2.

㉟ Audio Input Selector Switch

This switch is used to select either an HD Sound or Normal Audio input.

㊱ Video Input Connector (BNC Connector)

㊲ Video Output Connector (BNC Connector)

㊳ Time Code Input/Output Jack (Phono Jack)

Connect a Time Code Generator/Reader when you wish to record or play back the EBU time code.
This jack takes priority to the normal audio CH2 input jack.

㊴ Battery Pack Compartment

㊵ Battery Eject Button

㊶ Picture Control

㊷ Video Mode Switch

This switch is usually set to "COLOUR".
When recording or playing back with a monochrome camera or video input, set the switch to "AUTO".

㊸ Camera Trigger Switch

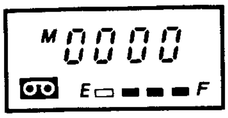
This switch is used to interlock the operation modes of this unit and the camera connected.
When connecting the unit to the camera of our company, set the switch to the plus side.
When connected to a camera of other maker, shift the switch to the minus side if the tape moves even with the "REC" in the electronic view-finder OFF.
Note that some of the cameras of other makers may sometimes fail to operate in normal conditions.

㊹ Dolby NR Switch

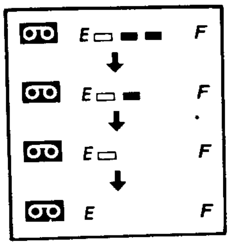
Battery Charging

Battery Indicator

The state of battery capacity is indicated in the counter display.



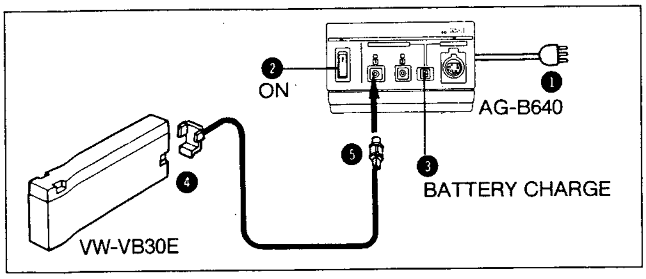
- When the battery pack is fully charged, the display will be as shown in the drawing.



- When the battery pack runs down, the ■ indicators will gradually go out from the right. When all of the ■ indicators go out, the battery pack can only be used for several more minutes. In this case, either charge the battery or replace it with a charged battery.
- When the ▭ indicators go out, the unit will be automatically turned OFF, and all indicators in the counter will go out, and then the Auto OFF/Tape End LED on the unit will flicker.

So, charge the battery pack, if necessary, according to the following procedure.

Using the AC Adaptor (option)



❶ Connect the power cord of the AC Adaptor to an AC power outlet observe proper polarity.
❷ Set the Power switch of the AC Adaptor to ON.
❸ Set the Mode Selector switch of the AC Adaptor to "Battery Charge".
❹ Connect the cable provided with the AC Adaptor to the battery pack. (Do not mistake the connector side.)
❺ Connect the plug on the opposite side of the cable to the external battery connector on the AC Adaptor. The Battery Charging Lamp lights and the charging will start.

- The necessary charging times are as follows.

VW-VB30E	Charging time
1 pc	Approx. 1.5 hours
2 pcs	Approx. 3 hours

With the battery pack quickly charged, the charge lamp goes out. But it is recommended to charge the battery pack taking time twice longer or more so that it will last longer.

Recording Time When Unit is Run on Battery Pack

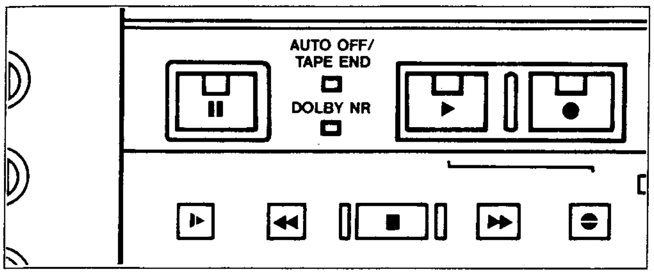
When a fully charged battery pack is inserted in the unit and used at normal temperature (20°C), the standard recording time is as follows:

Connection	Battery Pack VW-VB30E
To Video and Audio Input Connectors	Approx. 1.5 hours
Video camera WVP-F10 (CCD type)	Approx. 80 min.
Video camera WV-V3 (three-tube type)	Approx. 40 min.

- If you use the unit intermittently, the recording time will be increased. It is therefore recommended that you set the VTR switch of the unit to OFF as far as possible when not using the unit.
- Do not use an insufficiently charged battery or one which has reached the end of its life. This is because the unit will be automatically switched OFF during operation in order to protect both the battery pack and the unit.
- If the ambient temperature is low, the recording time will be increased.

In order to reduce the power consumption of the battery pack and to stabilize the video camera, use the camera's battery pack for power supply to video camera.

Warning LED



This video recorder is provided with an Auto OFF/Tape End LED which protects the cassette tape and also prevents operating trouble. The Auto OFF/Tape End LED lights or flashes to indicate the following alarm conditions.

Warning	LED Indicator	Cause	VTR Operation	Remarks
Auto OFF	Lights	Condensation occurs inside the unit. Condensation occurs in the following cases: •When the unit is used in a very humid or steamy location. •When the unit is abruptly moved from a cold place to a warm place.	Stops	•Only the Eject button functions. Press the Eject button, remove the cassette tape, then, leaving the VTR switch ON, wait until the LED goes out.
	Flashes	Battery capacity is low (10.5V undercut)	Stops	•The operation buttons of the unit cannot function. Also, the internal power will be OFF. Replace the battery pack with a fully charged one.
	Flashes	Cassette tape unloading failure	Stops	•The cassette tape cannot be removed. The internal power will be turned OFF. Consult your local dealer.
Tape end	Flashes	Tape end is reached. The tape cannot be rewound to the beginning when recording from a video camera.	Stops	•The Rec Tally indicator in the viewfinder of the video camera will go out. Set the Camera Remote switch to OFF and VTR switch to OFF and then to ON. After that, press the Eject button to replace the cassette tape.

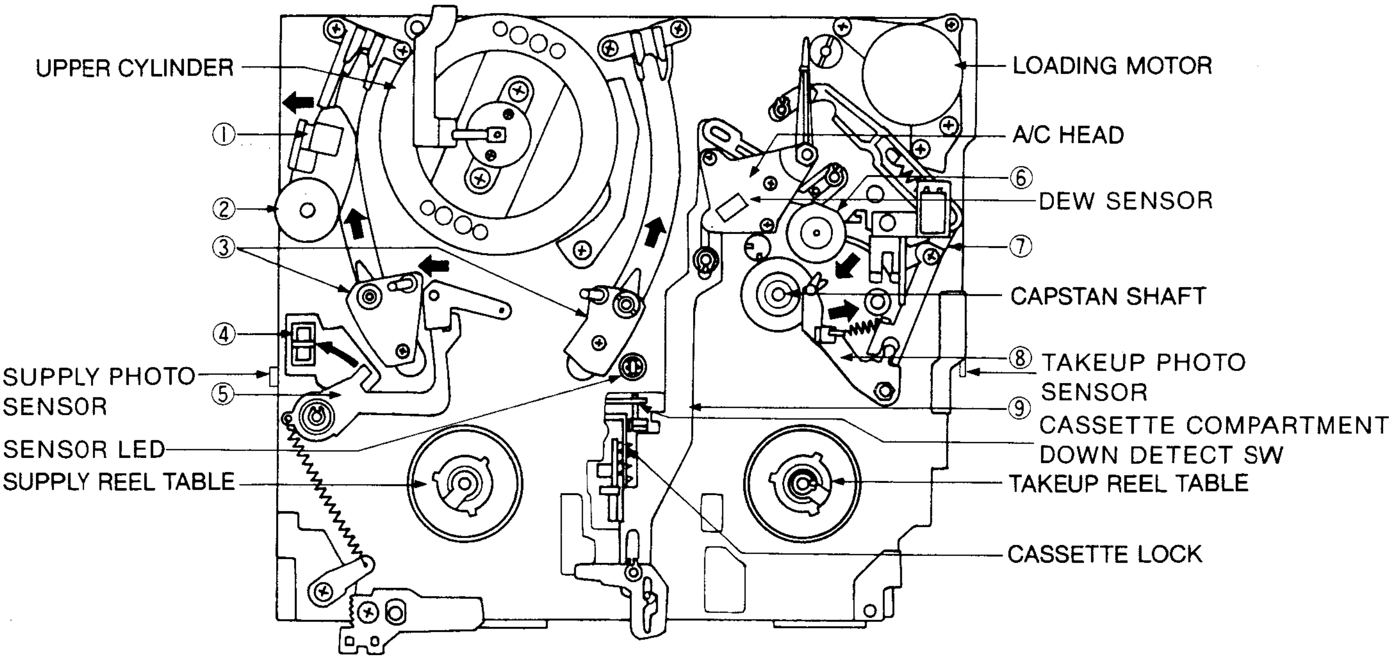
Note:
During recording or playback, the protection circuit in this unit may function to lock the cylinder, relay motor, and loading. In that case, the unit stops operating and is automatically shifted to Stop mode even with the operation button pressed.

1. MECHANICAL SECTION

The AG-6400 is constructed on a VHS chassis, employing five motors for the tape transport mechanism and one solenoid (compared to the AG-6500 which uses three solenoids).
This allows a reduction in the number of mechanical parts, weight and size.

These electro-mechanical devices are controlled by the system control servo and ree servo circuits.
See Figures 1-1 and 1-2 for the location and function of major parts of the transport mechanism.

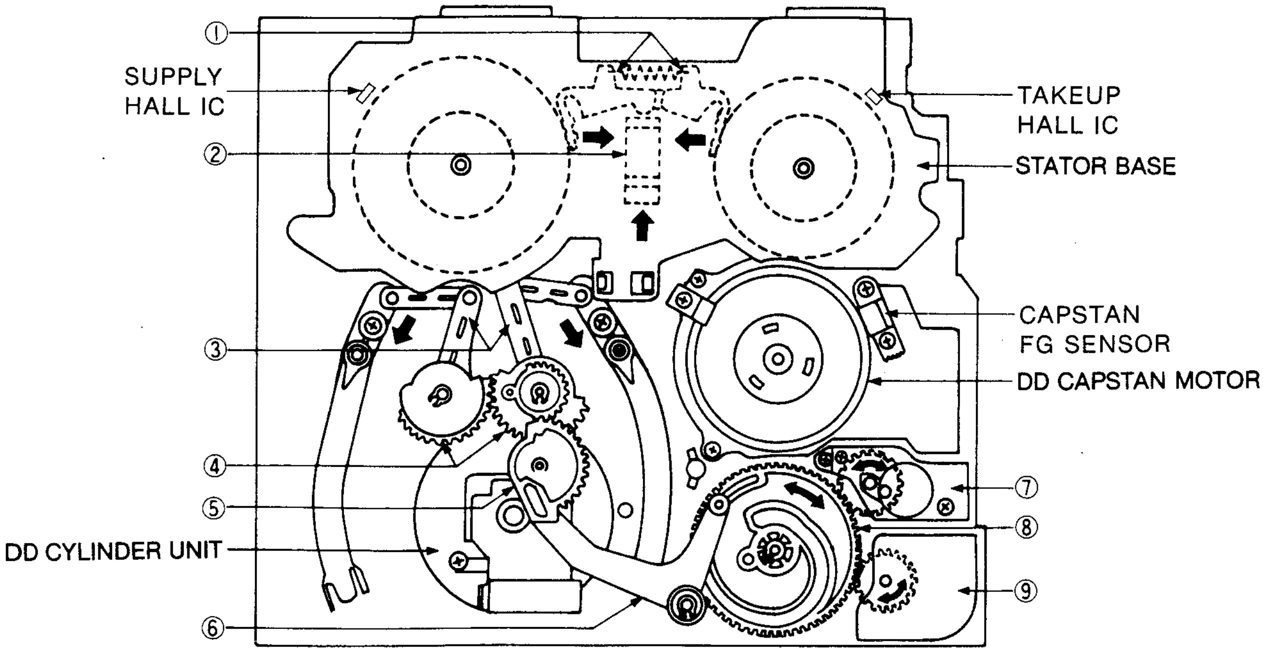
1-1. Major Mechanical Parts and Function (Top Side)


UPPER CYLINDER
①
②
③
④
SUPPLY PHOTO SENSOR
⑤
SENSOR LED
SUPPLY REEL TABLE
LOADING MOTOR
A/C HEAD
⑥
DEW SENSOR
⑦
CAPSTAN SHAFT
⑧ TAKEUP PHOTO SENSOR
⑨
CASSETTE COMPARTMENT DOWN DETECT SW
TAKEUP REEL TABLE
CASSETTE LOCK

NO.	NAME	FUNCTION	NO.	NAME	FUNCTION
①	FE Head	When the loading is over, this head moves in the arrow mark direction up to its contact point with the tape in order to erase the full tape width in recording	⑥	Pinch Roller	When the loading is over, this pinch roller moves in the arrow mark direction to run the tape at correct capstan speed.
②	Limiter Roller	This roller reduces influence of tape vibration to the cylinder.	⑦	P5 Kick Lever	The P5 arm is driven by action of the gear with cam.
③	Inclined Base	For the loading action, this base moves in the arrow mark direction to take out the tape from the cassette inside and wind it onto the head cylinder.	⑧	P5 Arm	The P5 arm moves in the arrow mark direction to stabilize the tape running in REV mode.
④	Tension Sensor	Tape slackening is detected by movement of the Tensim Regulator Arm and Sensor. Sensor signals Control the supply reel speed.	⑨	Main Lod	The main brake is actuated by action of the gear with cam. Moreover, this rod release the look lever (A) and lifts the cassette unit for taking out the tape.
⑤	Tension Arm	This arm acts in the arrow mark direction, during tape running conditions and keeps the tape tension at a constant value.			

Figure 1—1 Major Parts and Function of Top Side

1–2. Major Mechanical Parts and Function (Bottom Side)



NO.	NAME	FUNCTION	NO.	NAME	FUNCTION
①	Main Brake	A brake action is given to the reel stand during tape running conditions or the mode switching actions.	⑥	Lock Arm	This arm cooperates with the gear with cam to drive the lock gear.
②	Brake Solenoid	The main brake for the reel stand is actuated.	⑦	Mode Select	This switch detects each mode position through rotation of the gear with cam and gives an output to the system control circuit.
③	Loading Arm	This loading arm transfers the video tape to its loading direction through rotation of the loading gear.	⑧	Cam Gear	The loading gear and the main rod are driven through rotation of the loading motor.
④	Loading Gear	This gear is driven to initiate loading and unloading action of the tape.	⑨	Loading Motor	Loading and unloading of the tape is assured by this motor.
⑤	Lock Gear	This gear is actuated by the gear with cam to drive the loading gear for loading and unloading the tape.			

Figure 1—2 Major Parts and Function of Bottom Side

2. SYSTEM CONTROL CIRCUIT

2–1. General Description

1) Microprocessors

The main purpose of the system control section is to drive the mechanism in accordance with the front panel key operation using the microprocessors as follows.

IC6001: MN1534VGA
IC6007: uPD7503G186
IC6501: uPD7503G490

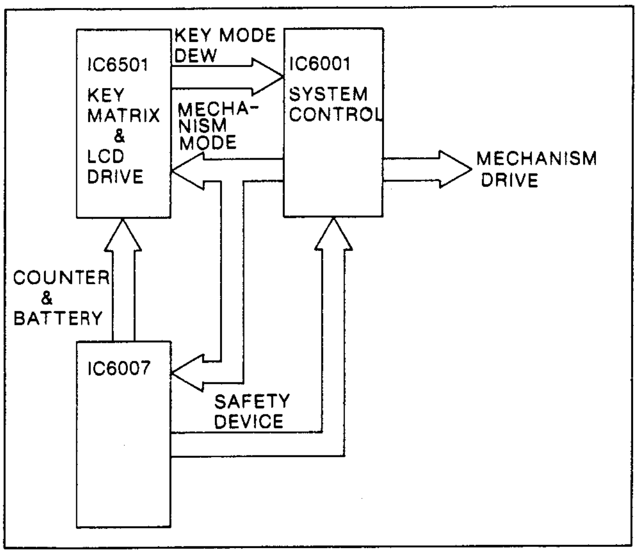

KEY MODE
DEW
IC6501
KEY
MATRIX
&
LCD
DRIVE
MECHA-
NISM
MODE
IC6001
SYSTEM
CONTROL
MECHANISM
DRIVE
COUNTER
&
BATTERY
IC6007
SAFETY
DEVICE

Figure 2–1 Microprocessors

2) Pause Timer

To prevent tape damage, Pause timer is operated as shown in Figure 2–2.

3) Short Rewind Operation for Add–on Recording

When the pause key is pressed during recording, a short rewind operation is performed for 1.4 sec and then the unit waits for the next pause key input. The sequence for Add–On Recording is as follows:

(A) Pause key is pressed during recording.
(B) Short Rewind runs for 1.4 sec.
(C) The loading motor runs in the unload direction, untill the REC/PAUSE mode is achieved. The loading motor then stops. This dectection is accomplised by the mode. Select switch reaching the pause position.
(D) The unit is now in the REC. PAUSE mode.
(E) The pause key is pressed again to release the pause.
(F) Short playback (1.0 sec) begins for synchronization between the playback control pulse and the vertical sync. of the incoming Video.

4) Safety Features

If any of several undesirable conditions occurs, this unit will automatically go to stop mode, and the power switch is turned off, if necessary.
Refer to figure 2–4 in detail.

(G) Add on recording begins.
This process is performed by the System Control and Servo Circuit.

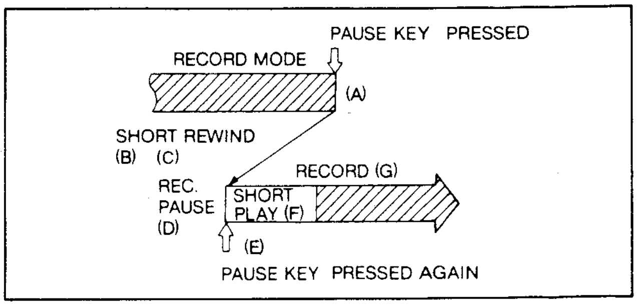

PAUSE KEY PRESSED
RECORD MODE
(A)
SHORT REWIND
(B) (C)
RECORD (G)
REC.
PAUSE
(D)
SHORT
PLAY (F)
(E)
PAUSE KEY PRESSED AGAIN

Figure 2—3 Add-on Record

SYSTEM	MODE	PAUSE TIMER	SAFETY OPERATION
VTR or + Wired Remote Control Pause Timer	STILL	about 5min	Auto Stop
	PAUSE		
	SLOW PLAYBACK	about 10min	Auto Stop
	SEARCH F.F REV.	—	——
VTR + Camera with Remote Control	STILL	about 5min	Tape is driven slightly and stays in STILL condition. (This is repent 5min interval.)
	PAUSE		Tape is rewind slightly and stays in Pause condition. (This is repent 5min interval.)
	SLOW PLAYBACK	—	——
	SEARCH F.F REV.	—	——

Figure 2—2 Pause Timer

MODE	LAMP	PHENOMENON	FINAL MECHANICAL CONDITION	VTR POWER	DETECTING TIME	REMARK
AUTO OFF	LIGHT	DEW	UNLOAD	ON	—	
	FLASH	UNDER CUT	UNLOAD	OFF	—	
	FLASH	UNLOADING FAILURE	REMAIN	OFF	8 sec	
TAPE END	FLASH	TAPE END	UNLOAD	OFF	—	ONLY DURING RECORDING BY CAMERA WITH SERIAL DATA
		CYLINDER LOCK	UNLOAD	ON	4.2 sec	
		REEL LOCK	UNLOAD	ON	3.5 sec	
		LOADING FAILURE	UNLOAD	ON	8 sec	

Figure 2—4 Safety Features

2–2. Circuit Description

1) Serial Data Transmission

When the portable VTR is used as in the following, data transmission should be performed between each piece of equipment.
Each piece of equipment has microprocessor.
The system decides the mode in each microprocessor, which means the microprocessors must exchange the data between each other.
To exchange the data, serial data transmission is used (refer to Figure 2–5).
In this case, some information is converted into 8 bit logic data.
This 8 bit data is sent beginning with a MSB (Most–significant bit) and ending with a LSB (Least–significant bit) as shown in Figure 2–6.
To send the serial data accurately, the timing control signal is applied to the microprocessors, which is called the "SERIAL CLOCK".
The supply of data is triggered by the falling edge of the serial clock.
The reading of data is performed at the rising edge of the serial clock.

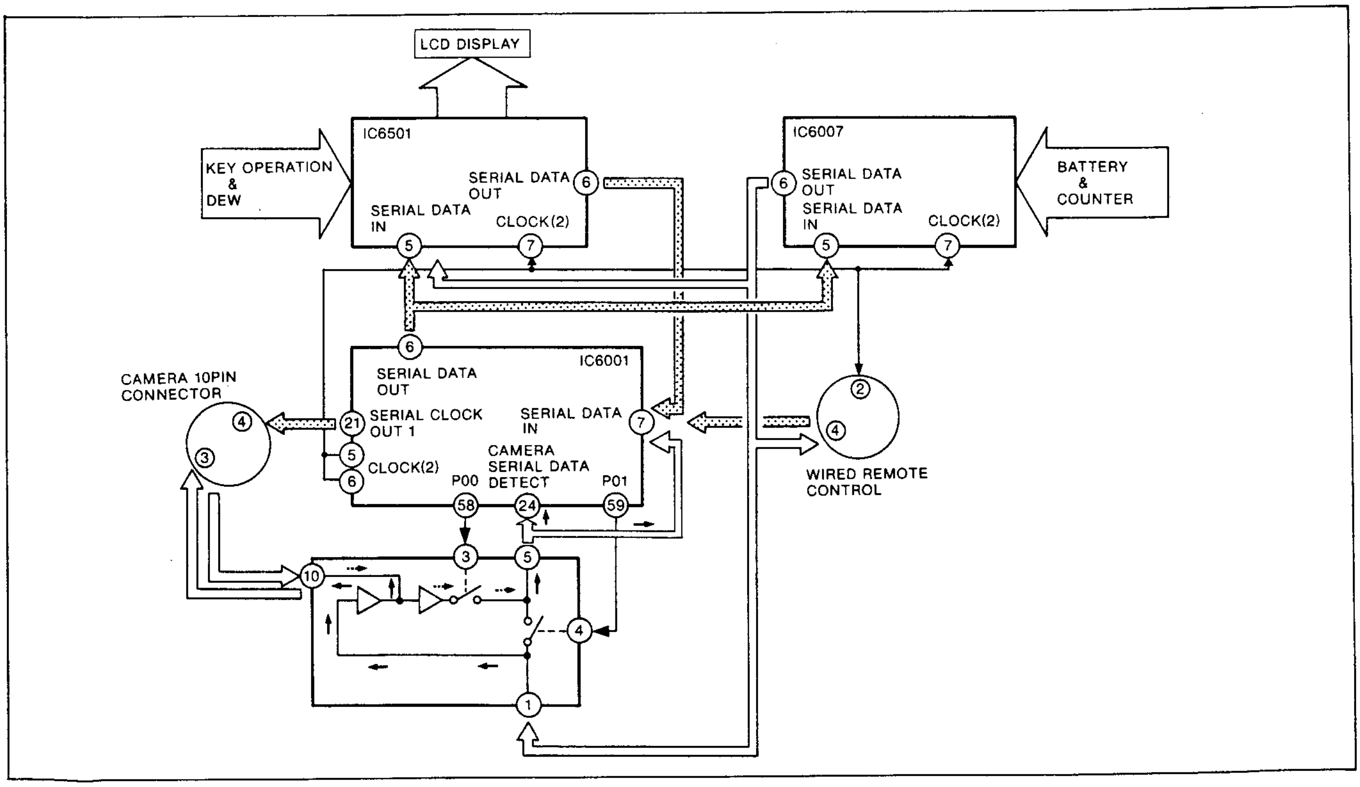

LCD DISPLAY
KEY OPERATION & DEW
IC6501
SERIAL DATA OUT
SERIAL DATA IN
CLOCK(2)
⑥
⑤
⑦
IC6007
SERIAL DATA OUT
SERIAL DATA IN
CLOCK(2)
⑥
⑤
⑦
BATTERY & COUNTER
IC6001
SERIAL DATA OUT
SERIAL CLOCK OUT 1
CLOCK(2)
SERIAL DATA IN
CAMERA SERIAL DATA DETECT
P00
P01
⑥
㉑
⑤
⑥
⑦
(58)
㉔
(59)
CAMERA 10PIN CONNECTOR
④
③
WIRED REMOTE CONTROL
②
④
③
⑤
⑩
④
①

Figure 2—5 Data Transmission

A. Serial Clock

The serial clock is a reference signal which is used to control the timing of the data transmission in each microprocessor.
The serial clock signal (2) is produced by the microprocessor IC6001:MN1534VGA, Pin 22, and is applied to the other microprocessors.
For the camera data transmission, the serial clock (1) which has the tally signal is produced at pin 21 of IC6001.
If the camera does not equip the serial data operation, the serial clock (1) is not generated, only the tally low signal is produced at Pin 21 of IC6001. (refer to Figure 2-7)
Both serial clocks have seven transmissions, and each transmission consists of 8 bit pulses.
During each transmission, the 8 bit serial data is exchanged as shown in Figure 2-8.
As shown in Figure 2-6, the serial data are read out at rise fronts of the serial clock.
The data are classified into 4 bits from D0 to D3 and another 4 bits from D4–D7. The each 4 bits of the serial codes are indicated as hexadecimal numbers.

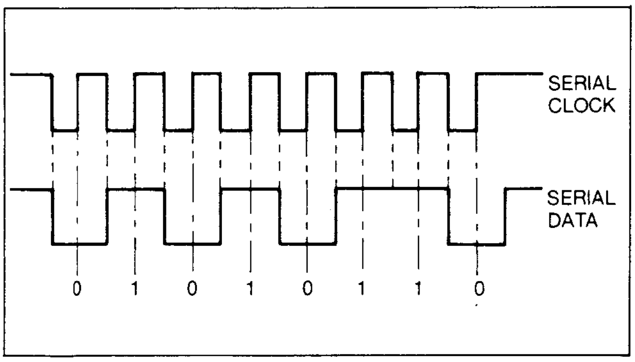

SERIAL CLOCK
SERIAL DATA
0
1
0
1
0
1
1
0

Figure 2—6 Serial Data

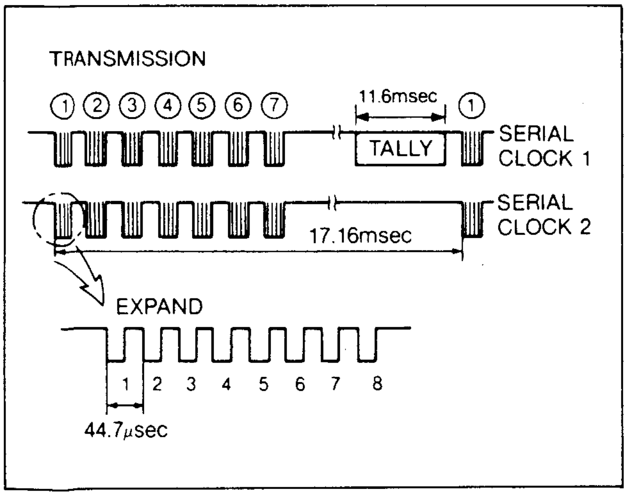

TRANSMISSION
①②③④⑤⑥⑦
11.6msec
①
TALLY
SERIAL CLOCK 1
SERIAL CLOCK 2
17.16msec
EXPAND
1 2 3 4 5 6 7 8
44.7μsec

Figure 2—7 Serial Clock

B. Serial Data

Serial data position (1), (2) and (3).
The serial data position (1), (2) and (3) are serial data sent from the camera, the system control microprocessor and the remote controller. The serial data in each mode is given in Figure 2-9.

Serial data position (4)
The serial data position (4) gives serial data outputs from the system control microprocessor IC6001, which are classified into 4 bits of D0–D3 and other 4 bits of D4–D7 and the D7 indicate ON/OFF of the rec inhibit switch.

Serial data position (5)

The serial data position (5) is used to discriminate the content of serial data (serial data position 6 and 7). The 4 bits of D4–D7 outputs the counter memory ON/OFF, the counter and the battery balance.

Serial data position (6) and (7)
The serial data position (6) and (7) are specified by the serial data position (5).
The counter number is transmitted as binary code as shown in Figure 2–15.

TRANSMISSION	TRANSMISSION No.	DATA
REMOTE CONTROL → IC6001	③	REMOTE CONTROL
IC6501 → IC6001	②	KEY OPERATION
CAMERA → IC6001	①	CAMERA KEY OPERATION
IC6001 → IC6501 IC6007	④	MECHANISM CONDITION/DEW
IC6007→ IC6501 CAMERA REMOTE CONTROL	⑤,⑥,⑦	COUNTER/ BATTERY

Figure 2—8 Transmission①-⑦

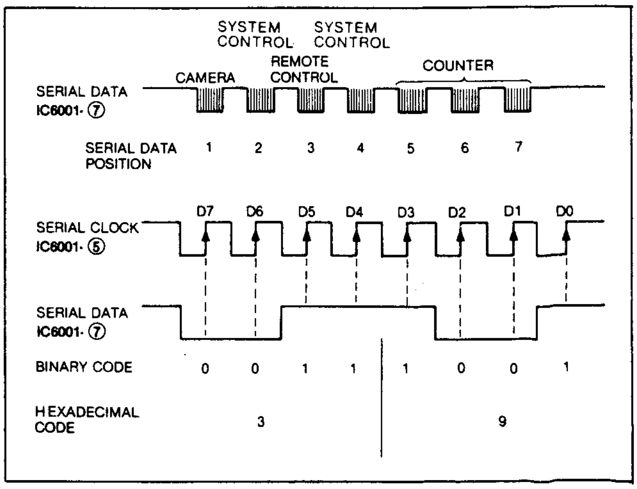

SYSTEM CONTROL
SYSTEM CONTROL
REMOTE CONTROL
CAMERA
COUNTER
SERIAL DATA IC6001-⑦
SERIAL DATA POSITION
1 2 3 4 5 6 7
D7 D6 D5 D4 D3 D2 D1 D0
SERIAL CLOCK IC6001-⑤
SERIAL DATA IC6001-⑦
BINARY CODE
0 0 1 1 1 0 0 1
HEXADECIMAL CODE
3
9

Figure 2—9 Serial Data

SERIAL CODE (BINARY CODE)								HEXADE-CIMAL CODE		MODE	*SERIAL CODE TRANSMITTER	TRANS-MISSION POSITION
0	0	0	0	0	0	0	0	0	0	STOP	S.W	② ③
0	0	0	0	0	0	1	0	0	2	REW	S.W	② ③
0	0	0	0	0	0	1	1	0	3	FF	S.W	② ③
0	0	0	0	0	1	0	0	0	4	SEARCH REVERSE	S.W.C	① ② ③
0	0	0	0	0	1	0	1	0	5	SEARCH FORWARD	S.W.C	① ② ③
0	0	0	0	0	1	1	0	0	6	STILL/PAUSE	S.W	① ②
0	0	0	0	1	0	0	0	0	8	REC	S.W.C	① ② ③
0	0	0	0	1	0	0	1	0	9	A. DUB	S.W	③
0	0	0	0	1	0	1	0	0	A	PLAY	S.W	② ③
0	0	0	0	1	1	1	1	0	F	SLOW	S.W.C	① ② ③
0	0	1	1	0	0	1	0	3	2	COUNTER MEMORY	S.C	① ②
0	0	1	1	0	0	1	1	3	3	COUNTER RESET	S.C	① ②
0	0	1	1	1	1	0	0	3	C	INSERT	C	①
1	0	0	1	0	1	1	0	9	6	STAND BY	C	①
1	0	0	1	1	0	1	0	9	A	CAMERA REC/PB SELECT PB	C	①

S: SYSTEM CONTROL (IC6501 → IC6001) W: WIRED REMOTE CONTROLER C: CAMERA

Figure 2—10 Serial Data for Transmission 1,2 and 3

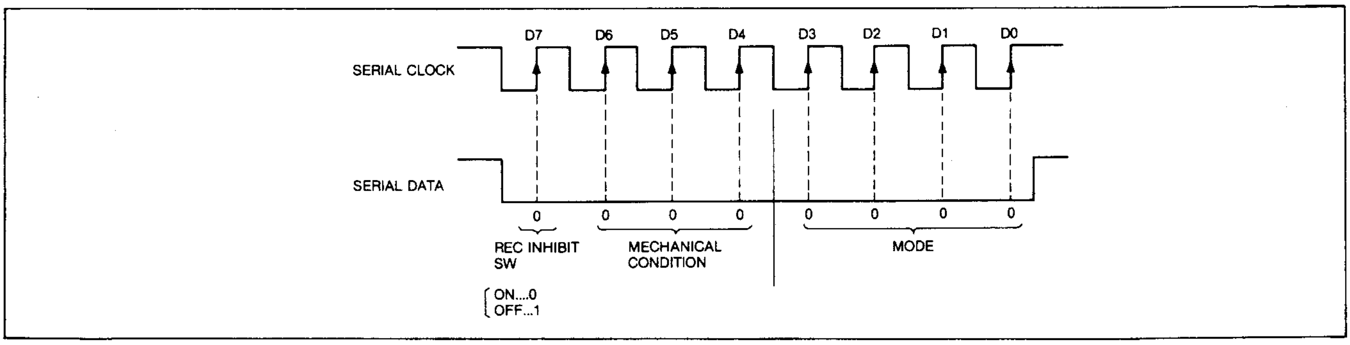


Figure 2—11 Serial Data

SERIAL CODE				HEXADE-CIMAL CODE	LOADING POSITION	MECHANICAL CONDITION
D7	D6	D5	D4			
0	0	0	0	0	STOP COMPLETION	STOP COMPLETION
0	0	0	1	1	STOP COMPLETION EJECT COMPLETION STOP COMPLETION	DURING FF OR REW EJECT COMPLETION STOP COMPLETION WITHOUT CASSETTE TAPE
0	0	1	0	2	DURING EJECT ACTION — LOADING COMPLETION	DURING LOADING OR UNLOADING
0	0	1	1	3	LOADING COMPLETION	PLAY — SEARCH PLAYBACK
0	1	0	0	4	REC. PAUSE — LOADING COMPLETION	PAUSE or STILL — LOADING COMPLETION
0	1	0	1	5	REC. PAUSE	REC. PAUSE COMPLETION
0	1	1	0	6	LOADING COMPLETION	LOADING COMPLETION IN REC MODE
0	1	1	1	7	LOADING COMPLETION	LOADING COMPLETION IN PLAY MODE

Figure 2—12 Serial Data for Transmission 4(D4~D7)

SERIAL CODE				HEXADE-CIMAL CODE	MODE	SERIAL CODE				HXADE-CIMAL CODE	MODE
D3	D2	D1	D0			D3	D2	D1	D0		
0	0	0	0	0	STOP	1	0	0	0	8	PLAY/SLOW
0	0	0	1	1	EJECT	1	0	0	1	9	STILL
0	0	1	0	2	REW	1	0	1	0	A	REC
0	0	1	1	3	FF	1	0	1	1	B	PAUSE
0	1	0	0	4	SEARCH REVERSE	1	1	0	0	C	A.DUB
0	1	0	1	5	SEARCH FORWARD	1	1	0	1	D	A.DUB/PAUSE
0	1	1	0	6	———	1	1	1	0	E	V.ADD
0	1	1	1	7	STAND-BY /POWER OFF	1	1	1	1	F	V.ADD/PAUSE

Figure 2—13 Serial Data for Transmission 4(D0~D3)

SERIAL CODE								INFORMATION		
D7	D6	D5	D4	D3	D2	D1	D0			
0	1	0	1	0	0	0	0	COUNTER NUMBER TRANSMISSION	"M" MARK DISPLAY	CAMERA REMOTE SW ON
0	1	0	1	0	1	0	1			CAMERA REMOTE SW OFF
0	0	0	0	0	0	0	0		"M" MARK NO DISPLAY	CAMERA REMOTE SW ON
0	0	0	0	0	1	0	1			CAMERA REMOTE SW OFF
1	1	1	1	0	0	0	0	REMAINING BATTERY TRANSMISSION	CAMERA REMOTE SW ON	
1	1	1	1	0	1	0	1		CAMERA REMOTE SW OFF	

Figure 2—37 Serial Data for Transmission 5

COUNTER NUMBER (EXAMPLE)				SERIAL DATA															
				TRANSMISSION 6								TRANSMISSION 7							
				D7	D6	D5	D4	D3	D2	D1	D0	D7	D6	D5	D4	D3	D2	D1	D0
3	2	1	0	0	0	1	1	0	0	1	0	0	0	0	1	0	0	0	0
4	3	2	1	0	1	0	0	0	0	1	1	0	0	1	0	0	0	0	1
5	4	3	2	0	1	0	1	0	1	0	0	0	0	1	1	0	0	1	0
6	5	4	3	0	1	1	0	0	1	0	1	0	1	0	0	0	0	1	1
7	6	5	4	0	1	1	1	0	1	1	0	0	1	0	1	0	1	0	0
8	7	6	5	1	0	0	0	0	1	1	1	0	1	1	0	0	1	0	1
9	8	7	6	1	0	0	1	1	0	0	0	0	1	1	1	0	1	1	0
0	9	8	7	0	0	0	0	1	0	0	1	1	0	0	0	0	1	1	1
1	0	9	8	0	0	0	1	0	0	0	0	1	0	0	1	1	0	0	1
2	1	0	9	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	1

Figure 2—15 Serial Data for Transmission 6 and 7

	SERIAL CODE															
	TRANSMISSION 6								TRANSMISSION 7							
L.C.D. DISPLAY	D7	D6	D5	D4	D3	D2	D1	D0	D7	D6	D5	D4	D3	D2	D1	D0
E ▭ F	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
E ▭ ■ F	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
E ▭ ■ ■ F	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
E ▭ ■ ■ ■ F	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
(UNDER CUT)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure 2—16 Serial Data for Transmissions 6 and 7 (2)

2) Power Circuit

a) Power Switch Circuit

The Power Switch Circuit is shown in Figure 2–17. This Power Switch Circuit controls the microprocessor IC6501 and generates the Power SW ON/OFF control signals from the Output Ports pin 14 and 15 of the microprocessor IC6501, controlling the power of the all circuits.

The +5V is supplied to Pin 58 of IC6501 via the regulator circuits Q6501 and Q6506, when the Power Switch is turned ON. And the power switch on low signal is applied to Pin 11 of IC6501, and then the high signal is produced at Pin 14 of IC6501 to turn on the 12V/5V/9V Power Switch Circuits. And the power is supplied to the all circuits. And LED 5V is fed to QR6509, which is turned on.

When the Power Switch is turned off, the power off request low signal is applied from Pin 15 of IC6501 to the inverter QR6006, and the inverted signal is sent to Pin 25 of IC6001.

If the mechanism is in the STOP mode, the power off command low signal is applied from Pin 49 of IC6001 to Pin 10 of IC6501 to turn off the power.

If the mechanism is in the loading completion mode, the power off low signal is generated at Pin 49 of IC6001 after the unloading completion, then the power off.

The timing of power off mode is shown in figure 2–18.

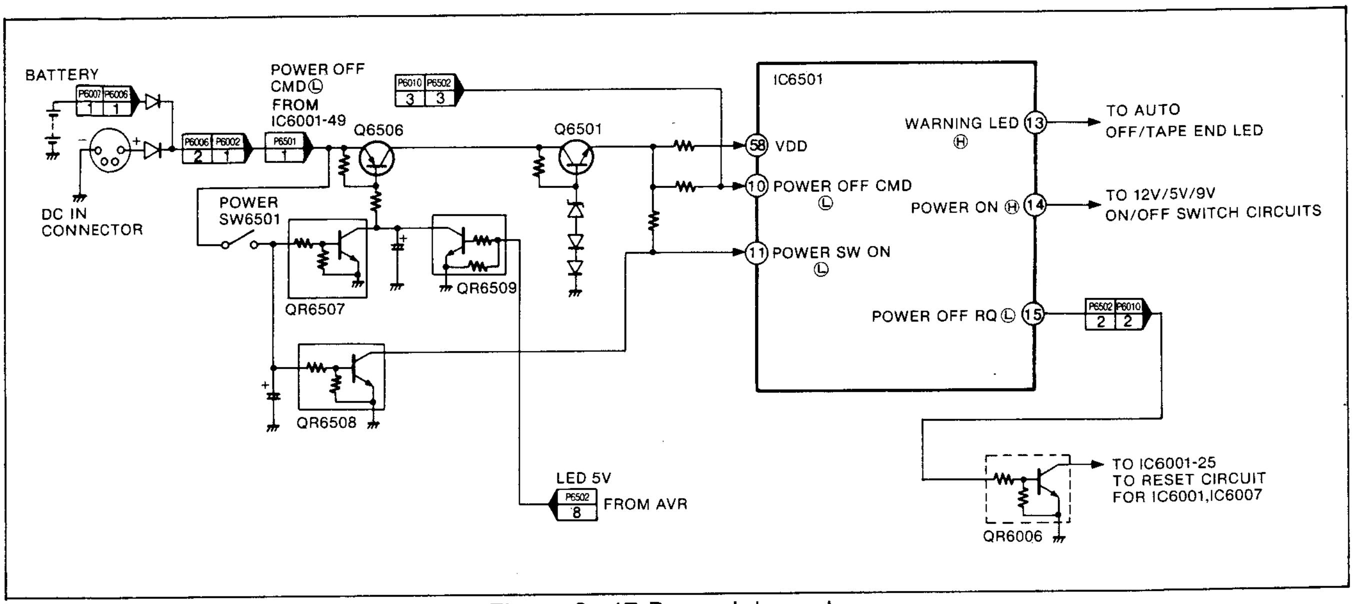

BATTERY
P6007 P6006
1 1
DC IN
CONNECTOR
POWER OFF
CMDⓁ
FROM
IC6001-49
P6010 P6502
3 3
P6006 P6002
2 1
P6501
1
Q6506
Q6501
POWER
SW6501
QR6507
QR6509
QR6508
LED 5V
P6502
8
FROM AVR
IC6501
58 VDD
10 POWER OFF CMD
Ⓛ
11 POWER SW ON
Ⓛ
WARNING LED 13
Ⓗ
POWER ON Ⓗ 14
POWER OFF RQⓁ 15
TO AUTO
OFF/TAPE END LED
TO 12V/5V/9V
ON/OFF SWITCH CIRCUITS
P6502 P6010
2 2
TO IC6001-25
TO RESET CIRCUIT
FOR IC6001,IC6007
QR6006

Figure 2—17 Power Interrupt

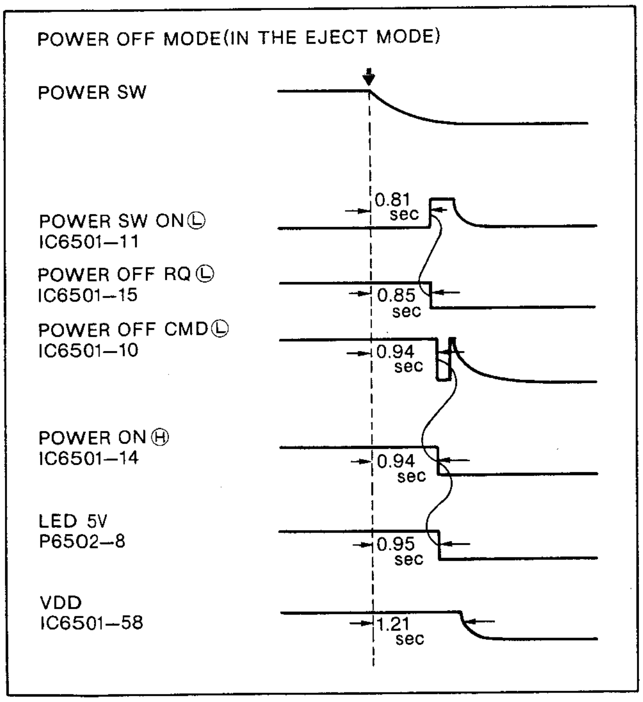


Figure 2—18 Power OFF Timing

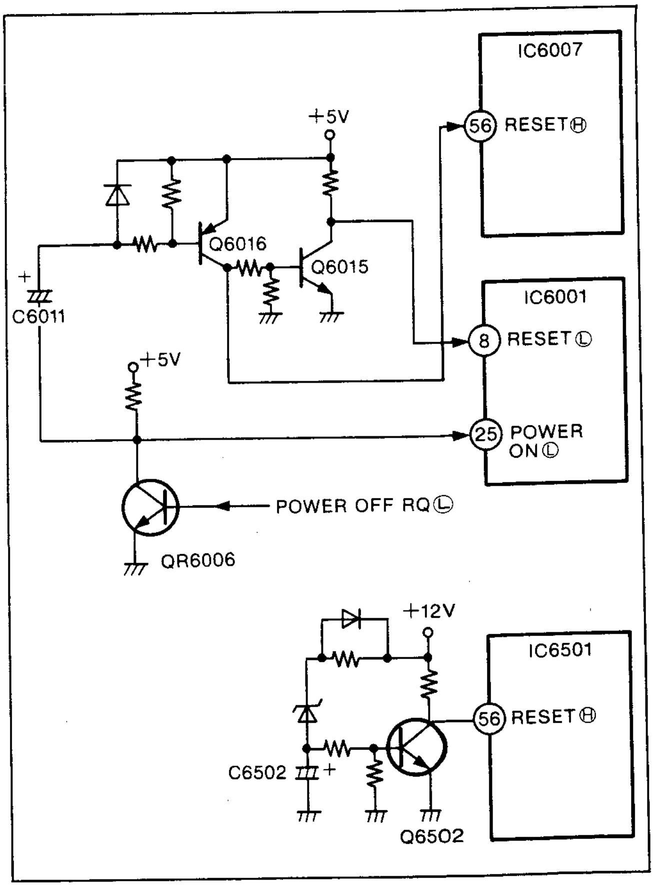

IC6007
56 RESETⒽ
+5V
Q6016
Q6015
C6011
IC6001
8 RESETⓁ
+5V
25 POWER
ONⓁ
POWER OFF RQⓁ
QR6006
+12V
IC6501
56 RESETⒽ
C6502
Q6502

Figure 2—19 Power Interrupt

b) Power Interrupt

During any operation, if the power switch is turned OFF a high signal is applied to Pin 25 of IC6001, and the unit is placed in the STOP mode.

c) Auto Off

If under cut or unloading failure occurs or tape end is detected during recording by camera with serial data, as shown in figure 2-4, power off command low signal is fed out from pin 49 of IC6001 to pin 10 of IC6501. IC6501 detects the VTR is set to AUTO OFF or TAPE END mode.
Power off request low signal is supplied from pin 15 of IC6501 to pin 25 of IC6001 to turn the VTR off.
So, in those modes, IC6501 is alive, IC6001 and IC6007 are dead.

3. SERVO SECTION

3–1. Special Playback

1) Video Head (Excluding HiFi Audio Head)

This model has 2 head bases on the upper head cylinder, however each video head base has two video head.
The azimuth and the gap width of each head are shown in Figure 3–1. In the normal record and playback modes.
L and R heads are used. In the each special playback mode, the following video heads are used as shown in Figure 3–2.
As shown in Figure 3–1, the L head and L′ head are located on the same head base and have a small distance between both heads which is equal to the double length of one horizontal period of video signal on the tape pattern. One track length can be determined by the following equation.

Track length = (Cylinder Diameter X 3.14)/2
= (62 X 3.14)/2
= 97.39mm

There are 312.5 horizontal periods recorded on each track and one horizontal period length is;

One Horizontal Period Length
= Track Length /312.5
= 97.39 /312.5
= 0.312mm
= 310um

Therefore, the distance between 2 video heads on the same base is approx. 620um.
As explained later, these video heads are switched or selected according to the mode in order to get a larger envelope. If this distance between the video heads was not double horizontal period, skew will take place when the heads are switched. To prevent this skew, the video heads distance on the same head base should be equal to the double length of one horizontal signal on the tape pattern.

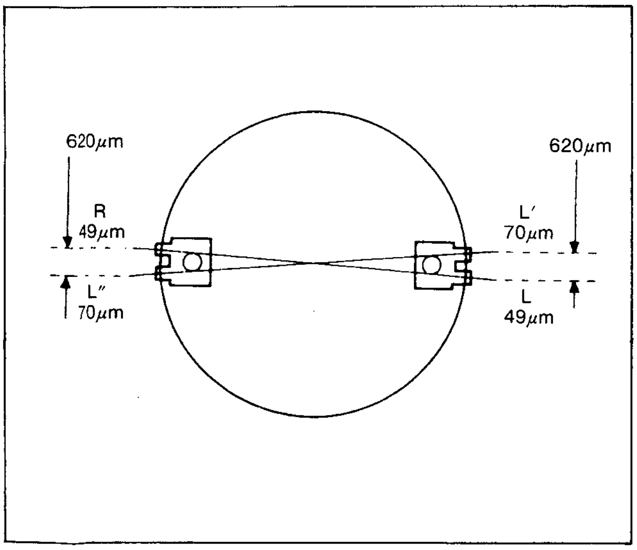


Figure 3—1 Double Azimuth Head

MODE	REQUIRED VIDEO HEAD
NORMAL PLAYBACK	L,R
SEARCH	L,R
SLOW	R,L′, L″
STILL	L′ L″

Figure 3—2 Head Selection

2) Search Mode

The head amp outputs from R–L head pair in Search Mode are shown in Figure 3–2.
It shows that the R head traces first field by selecting either head and the L head traces the next field afternatively.
As shown in Figure 3–4 each pair of heads are connected to each head amplifier circuits.
For information about the comparator, please refer to the video circuit explanation.
By using both pairs of head outputs, a continuous output RF envelope is produced as shown in Figure 3–3.
When the selected pair of heads are changed, the chrominance vector rotation has to be changed accordingly.
This is performed by the signal from pin 8 of IC2001. This rotation select signal is decided by the combination of the head switching signal and the head amp select signal as shown in Figure 3–5.

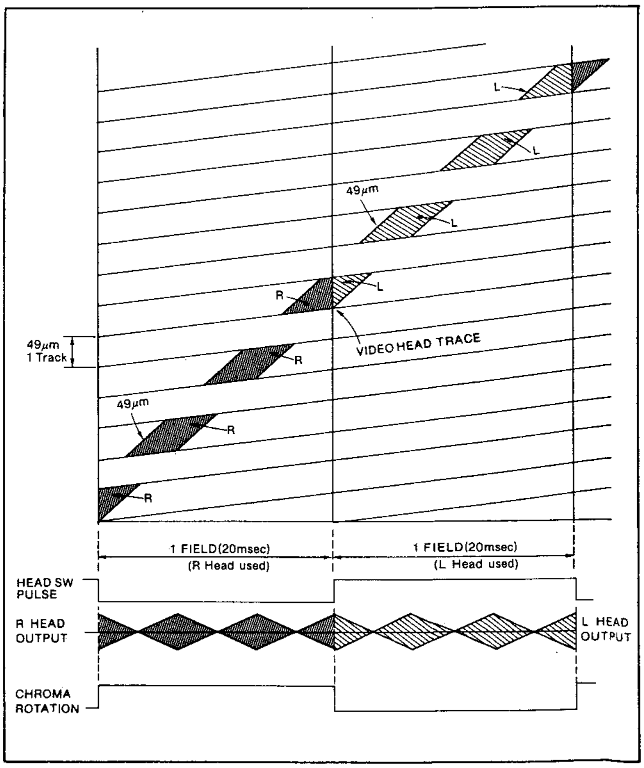


Figure 3—3
Video Head Movement during Search Mode

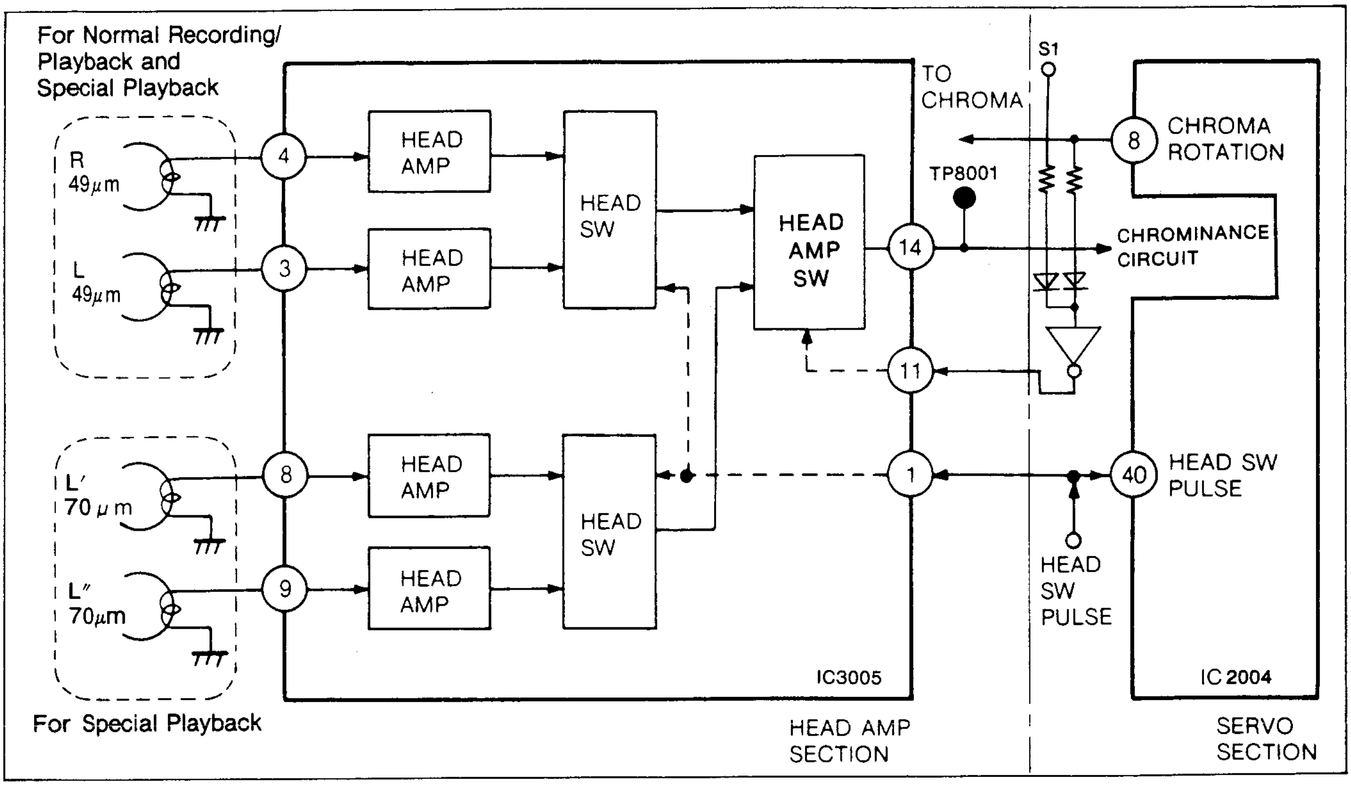

For Normal Recording/
Playback and
Special Playback
R
49μm
L
49μm
L′
70μm
L″
70μm
For Special Playback
4
3
8
9
HEAD AMP
HEAD AMP
HEAD AMP
HEAD AMP
HEAD SW
HEAD SW
HEAD AMP SW
TO CHROMA
TP8001
14
11
1
L
IC3005
HEAD AMP SECTION
S1
CHROMA ROTATION
8
CHROMINANCE CIRCUIT
40
HEAD SW PULSE
HEAD SW PULSE
IC 2004
SERVO SECTION

Figure 3—4 Head Amp Selection

HEAD SW PULSE IC2001-40	HEAD AMP SELECT P2003-5	CHROMA ROTATION IC2004-8	ACTIVATED VIDEO HEAD
H	H	L	L′
H	L	H	L
L	H	L	L″
L	L	H	R

Figure 3—5 Video Head Selection during Slow Mode

3) Slow Mode

To achieve noiseless slow, in the playback mode the tape movement should be controlled, so that the video heads trace is shown in Figure 3–6.

The slow playback alternates still playback and normal playback using 3 heads to assure a noiseless playback picture. The capstan motor is driven intermittently, because the intermittent tape movement is needed as it was for recording. The drive and brake timing of the capstan motor is controlled by the head switching signal and the control signal so that the head will exactly track the video path on the moving tape to prevent noise from appearing during the intermittent capstan motion. The same azimuth head is used for 1 track (1 field) playback in the still mode to avoid any picture blur. Additionally, the timing to stop the tape is adjusted to a position where the head can trace the record track exactly.
This complicated control is performed by the microprocessor IC2004: AN3710S and the following processes are required in order to control slow operation.

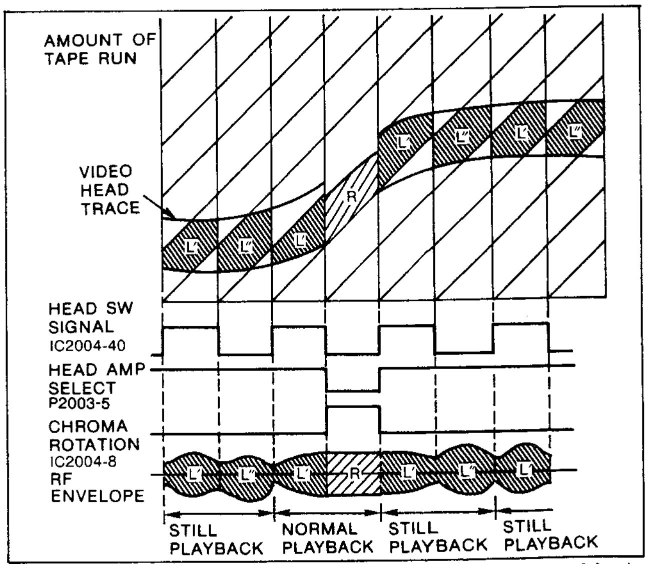

AMOUNT OF TAPE RUN
VIDEO HEAD TRACE
L′
L″
R
HEAD SW SIGNAL IC2004-40
HEAD AMP SELECT P2003-5
CHROMA ROTATION IC2004-8
RF ENVELOPE
STILL PLAYBACK
NORMAL PLAYBACK
STILL PLAYBACK
STILL PLAYBACK

Figure 3—6 Video Head Movement during Slow Mode

a. When the slow key or still advance key is pressed on, the system control circuit produces Frame-Advance high signal and Reverse (H)/Stop (M)/Forward (L)-In signal and these signals are applied to pin 39 and pin 5 of microprocessor IC2004. Then IC2004 detects the slow or still advance mode and starts to control.
These two operations are essentially the same but slow operation is a kind of continuous movement or repetition of the still advance the slow speed is changed from 1/4 to 1/30 as the result of this interval change.

b. Next, the start M.M.V. (Digital Monostable Multivibrator) is triggered at the first falling edge after the rising edge of the Frame-Advance signal.
From now on, all slow operation would be started.

c. After 12.6msec from the trigger point the M.M.V., goes high. At that time, capstan ON M.M.V. works inside of the IC2004 and a Full Torque signal is supplied from pin 24 (low) to the capstan drive. Reverse/Stop/Forward-Out signal at pin 6 also goes low, so the capstan motor starts to rotate in forward direction.
At maximum torque.

d. When the capstan motor speed reaches approx. 80% of the normal rotation, the capstan speed controller starts, to keep in constant (80% of normal speed.)

e. During this constant speed period, a control pulse comes in.

f. After a certain period from the arrival of the control pulse, which is adjusted by the Slow Tracking Control, the current limit signal at pin 9 turns to low, and the current of the capstan motor is limited. At the same time, the Reverse/Stop/Forward-Out signal at pin 6 turns high, so the capstan motor brake action starts with the current limit.

g. After certain period, the current limit signal turns to high, so the capstan motor brake with the lower limited current starts.
Then the capstan motor speed is gradually reduced.

h. The direction of the capstan motor rotation is detected by observing the phase relation of Capstan FG1 signal at pin 25 and Capstan FG2 signal at pin 26, because these two FG heads are located mechanically so that the electrical phase difference becomes just 90 degrees.

i. Just at time when the rotation direction is changed to the opposite direction, the Reverse/Stop/Forward-Out signal (Pin6) goes low for a moments. This action is controlled by the Delay M.M.V. inside of IC2004, Pin6 then turns to the middle level.
The capstan motor stops as a result.

j. Head Amp Select.
Because still playback and normal playback are alternated in the slow mode, playback is carried out by 3 heads. Two same azimuth heads are used for the still playback and 2 different azimuth heads for the normal playback. Therefore, switching between the heads is necessary, and, furthermore, the heads to be used depend upon the recording mode. The L' and L" head are used for still playback. (Refer to Figure 3-6).
The head amp select signal is sent to the head amp. circuit. (on the luminance & chrominance board).
This head selection operation is done in the tape moving period, therefore in the waiting period, field still is obtained. The signal is picked up from the same track in the waiting period.
For selection of the video head, the head amp select signal at pin 5 of P2003 is as shown in Figure 3-7. This signal is applied to video circuit in order to select a specific head.

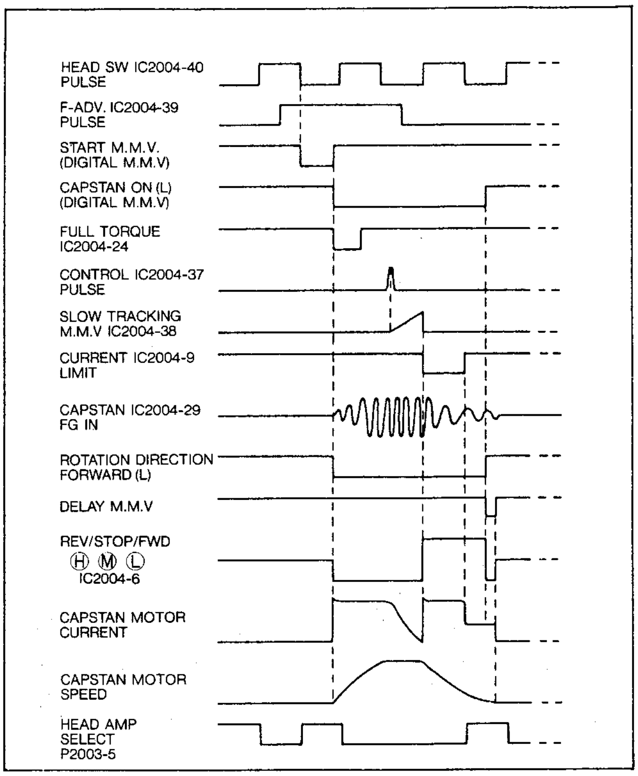


Figure 3-7 Slow Timing Chart

k. 1H V-DANCE
During the tape moving period in slow operation, the opposite azimuth head is used. At that time, the timing of the artificial V-sync should be changed slightly because the V-sync timing is shifted by the head switching.
Accordingly to the head switching during the tape moving period, 1H V-DANCE signal at pin 11 is changed as shown on the timing chart in Figure 3-25.
Then the level at pin 15 is changed accordingly to the compensator signal and since the level at pin 15 is used for the reference voltage for producing the artificial V-PULSE, the timing of the artificial V-PULSE signal is changed to prevent the V-dancing.
Refer to Figure 3-7 and Figure 3-8.

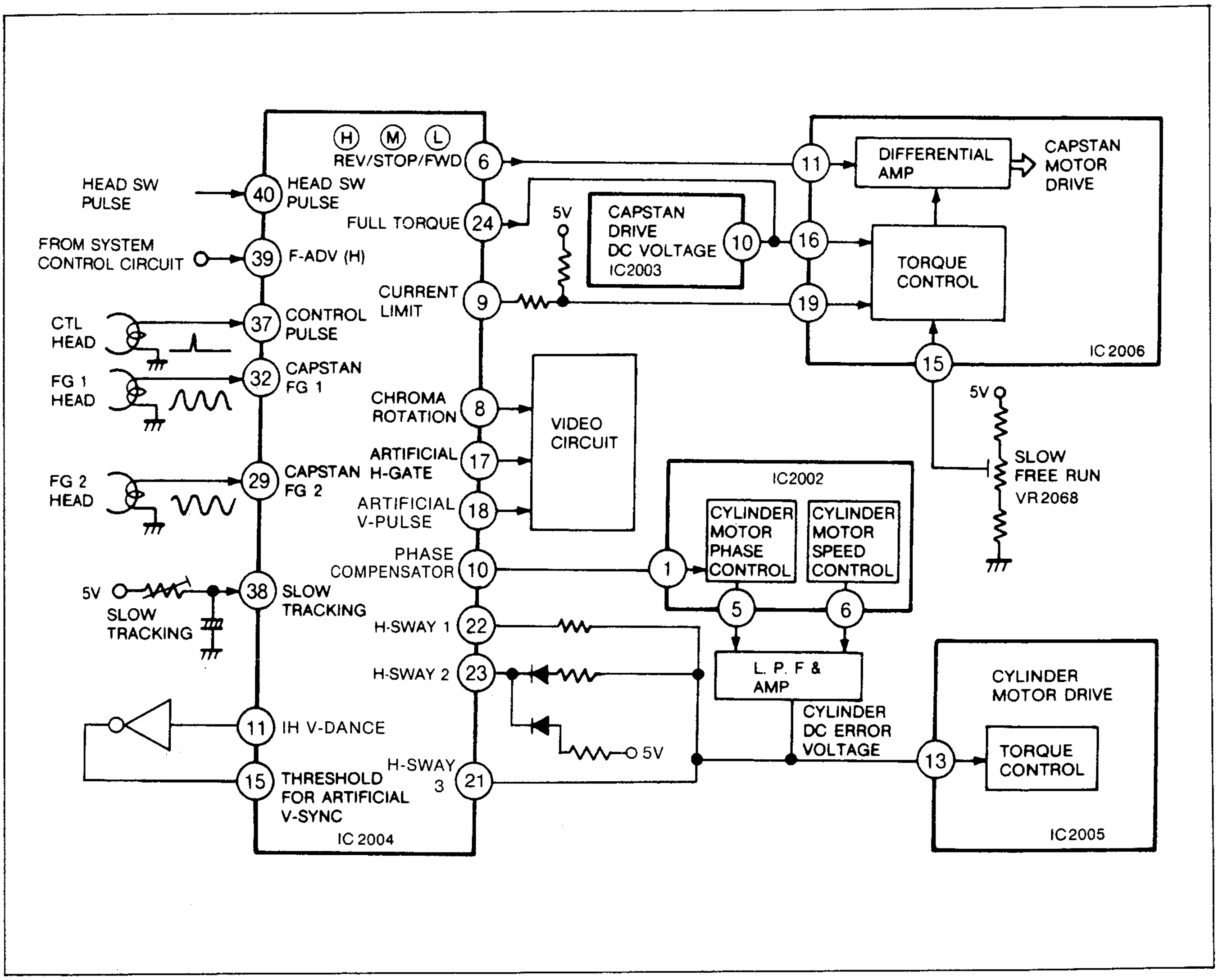

H M L
REV/STOP/FWD 6
HEAD SW PULSE
40 HEAD SW PULSE
FULL TORQUE 24
FROM SYSTEM CONTROL CIRCUIT
39 F-ADV (H)
5V
CAPSTAN DRIVE DC VOLTAGE IC2003 10
CURRENT LIMIT 9
CTL HEAD
37 CONTROL PULSE
FG 1 HEAD
32 CAPSTAN FG 1
CHROMA ROTATION 8
VIDEO CIRCUIT
ARTIFICIAL H-GATE 17
FG 2 HEAD
29 CAPSTAN FG 2
ARTIFICIAL V-PULSE 18
PHASE COMPENSATOR 10
5V
SLOW TRACKING
38 SLOW TRACKING
H-SWAY 1 22
H-SWAY 2 23
11 IH V-DANCE
5V
H-SWAY 3 21
15 THRESHOLD FOR ARTIFICIAL V-SYNC
IC 2004
11 DIFFERENTIAL AMP
CAPSTAN MOTOR DRIVE
16
19
TORQUE CONTROL
15
IC 2006
5V
SLOW FREE RUN VR2068
IC2002
1 CYLINDER MOTOR PHASE CONTROL
CYLINDER MOTOR SPEED CONTROL
5
6
L. P. F & AMP
CYLINDER DC ERROR VOLTAGE
CYLINDER MOTOR DRIVE
13 TORQUE CONTROL
IC2005

Figure 3—8 Slow Block Diagram

l. H—sway Compensations

During the acceleration period and brake period of capstan motor in the slow operation, the tape speed changes rapidly and causes the H—sway. To avoid this H—sway, the relative speed (tape to video heads) should be controlled so that the change is not so rapid.

During the forward full torque period, the level at pin 23 of IC2004 is low, so the cylinder motor speed is accelerated slightly.

When the capstan motor rotation speed reaches to 80% of the normal speed, H—sway 2 signal at pin 23 goes high while H—sway 1 at pin 22 goes low in order to accelerate or compensate the cylinder speed during the steady speed period of capstan motor. During the forward full torque period, the level at pin 23 of IC2004 is low, so the cylinder motor speed is decreased slightly. Refer to Figure 3—8 and Figure 3—9.

m. Artificial V—sync Signals

In the special playback mode, the tape/head speed is not constant.

Due to this and track tracing problem the v sync may be disturbed, as shown in Fig. 3—11. A clear picture can be seen by inserting in this portion, an artificial V—PULSE signal. Artificial H—gate signal is also inserted to lock horizontally.

These insertions are performed in the video circuit.

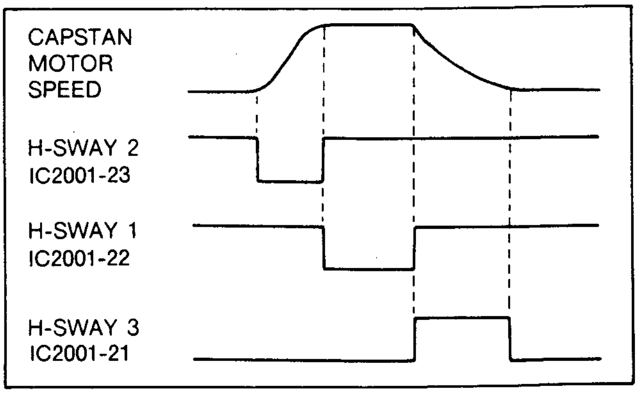


Figure 3—9 H-Sway Compensations

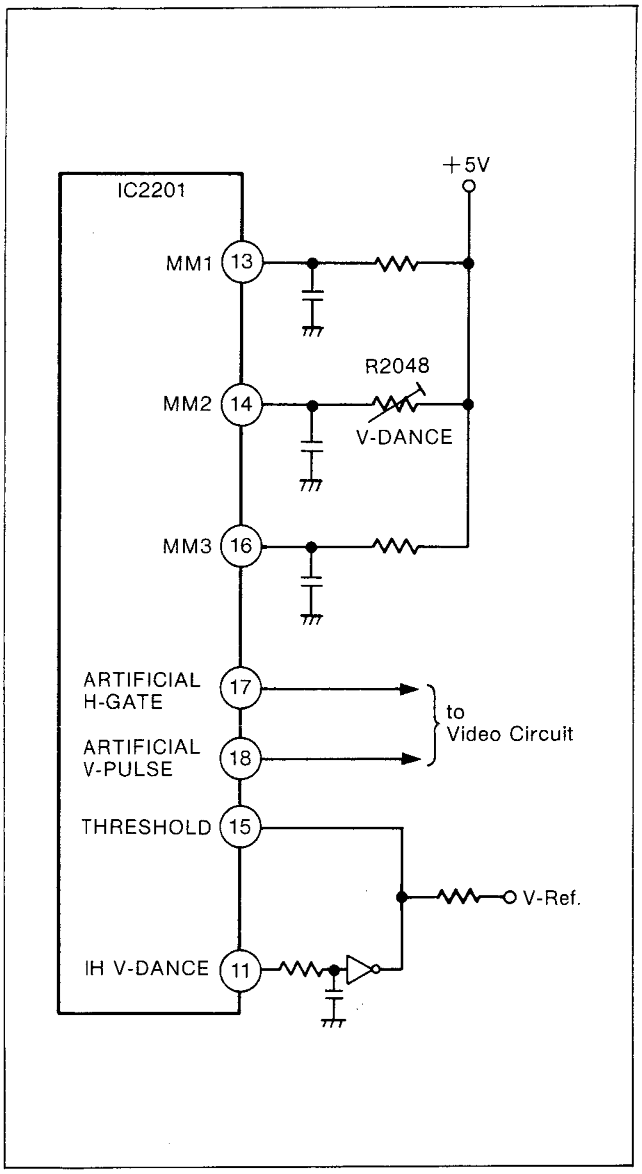

IC2201
+5V
MM1
13
MM2
14
R2048
V-DANCE
MM3
16
ARTIFICIAL H-GATE
17
ARTIFICIAL V-PULSE
18
to Video Circuit
THRESHOLD
15
V-Ref.
IH V-DANCE
11

Figure 3—10 Artificial V-sync Signals Block Diagram

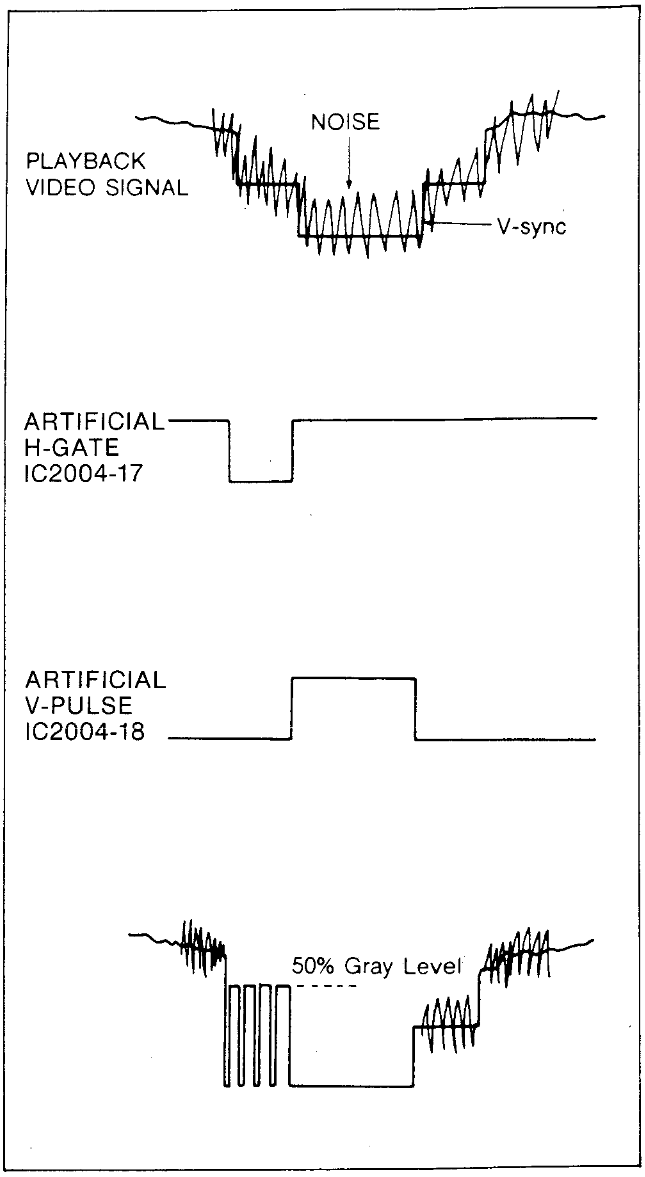

PLAYBACK VIDEO SIGNAL
NOISE
V-sync
ARTIFICIAL H-GATE IC2004-17
ARTIFICIAL V-PULSE IC2004-18
50% Gray Level

Figure 3—11 Artificial V-sync Signals

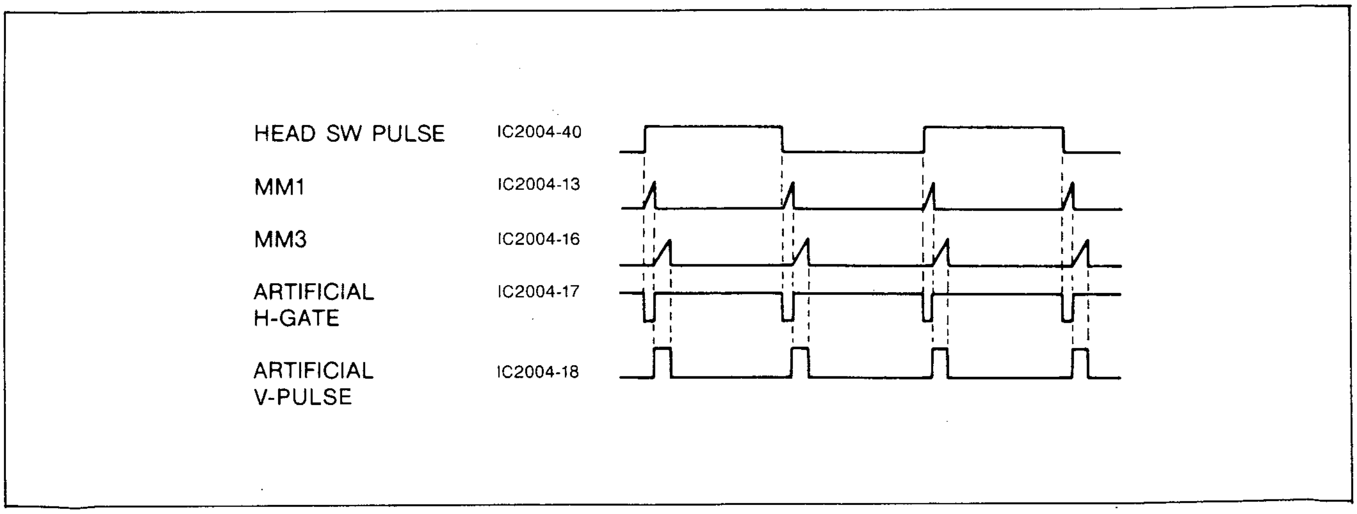

HEAD SW PULSE
IC2004-40
MM1
IC2004-13
MM3
IC2004-16
ARTIFICIAL H-GATE
IC2004-17
ARTIFICIAL V-PULSE
IC2004-18

Figure 3—12 Artificial V-sync Signals

3–2. Framing Circuit

To achieve interlace, the 625–line Frame is divided into two 312.5–line fields, and the vertical sync interval is divided into 1/2H (horizontal line timing) segments. These segments keep the horizontal sweep of the monitor in continuous synchronization. The two fields which make up a frame are called, field one and field two, or odd and even. For this discussion, field one, or the odd field, is that field which begins with 1/2H line, and field two, or the even field, is that field which begins with a one full H line. In order to have stable horizontal sweep, the field must come in sequence, and editing should only be performed between frames.

In the REC/Pause mode, the VTR already identified the frame for the incoming video signal so when release the pause mode, the VTR will identify the head switching pulse and the recorded CTL pulse on the tape. During the 2.0 second playback mode, it is always the R head which will record, the even field is on the CTL pulse position. After 2.5 seconds the VTR will start the recording.
When you start REC/Play mode from stop mode, first the VTR will go to REC/play after the time for tape loading is completed. The VTR is in the back space mode which (automatically) starts the REC/play function.

NOTE:
Therefore, the AG–6400 requires 2.0 seconds to identify the frame, if the VTR pause mode (camera trigger) is released during the back space edit time, it may not identify the frame at the time of recording.

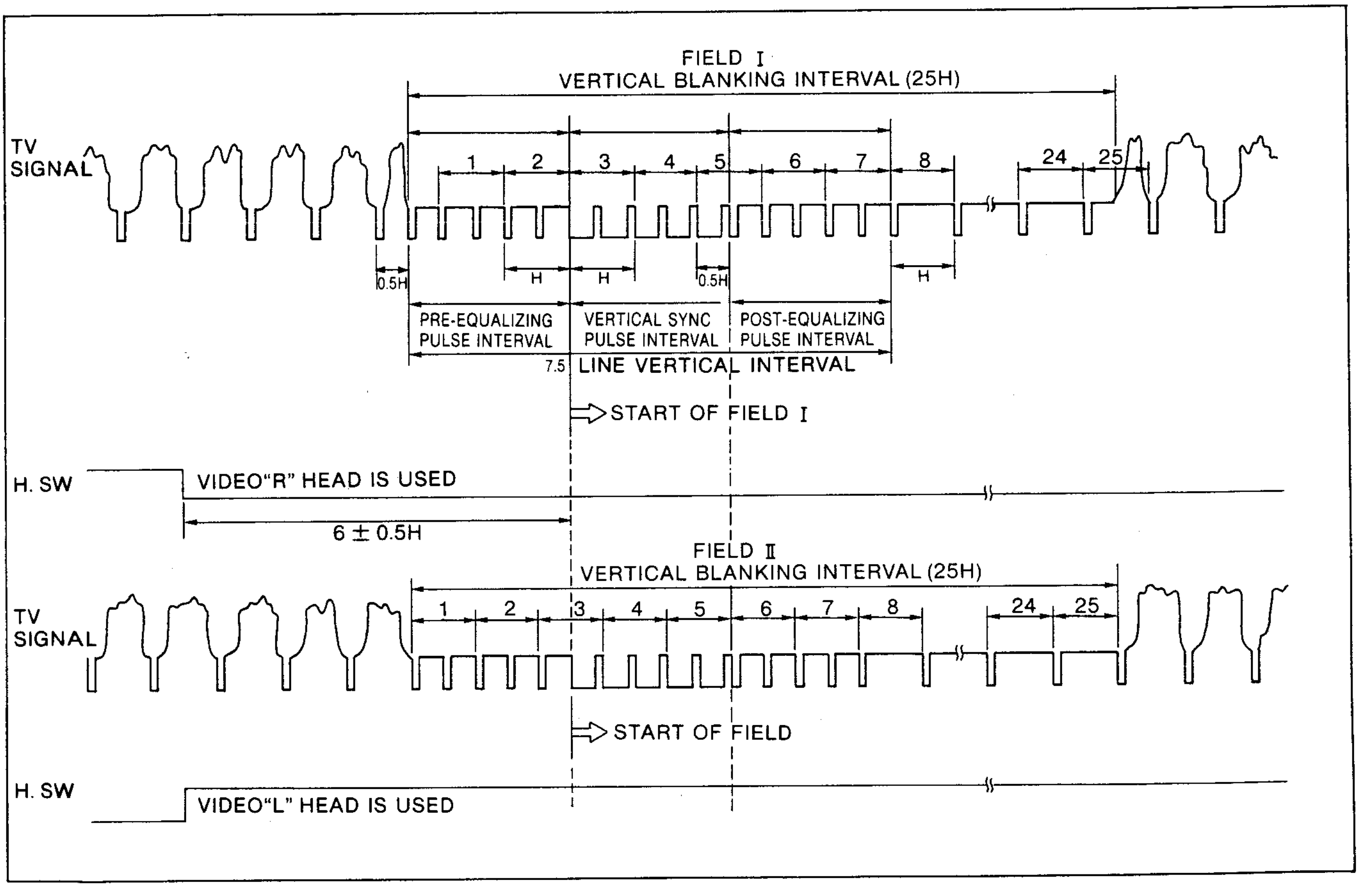

FIELD I
VERTICAL BLANKING INTERVAL (25H)
TV SIGNAL
1
2
3
4
5
6
7
8
24
25
0.5H
H
H
0.5H
H
PRE-EQUALIZING PULSE INTERVAL
VERTICAL SYNC PULSE INTERVAL
POST-EQUALIZING PULSE INTERVAL
7.5 LINE VERTICAL INTERVAL
START OF FIELD I
H. SW
VIDEO"R" HEAD IS USED
6 ± 0.5H
FIELD II
VERTICAL BLANKING INTERVAL (25H)
TV SIGNAL
1
2
3
4
5
6
7
8
24
25
START OF FIELD
H. SW
VIDEO"L" HEAD IS USED

Figure 3—13 TV SIGNAL

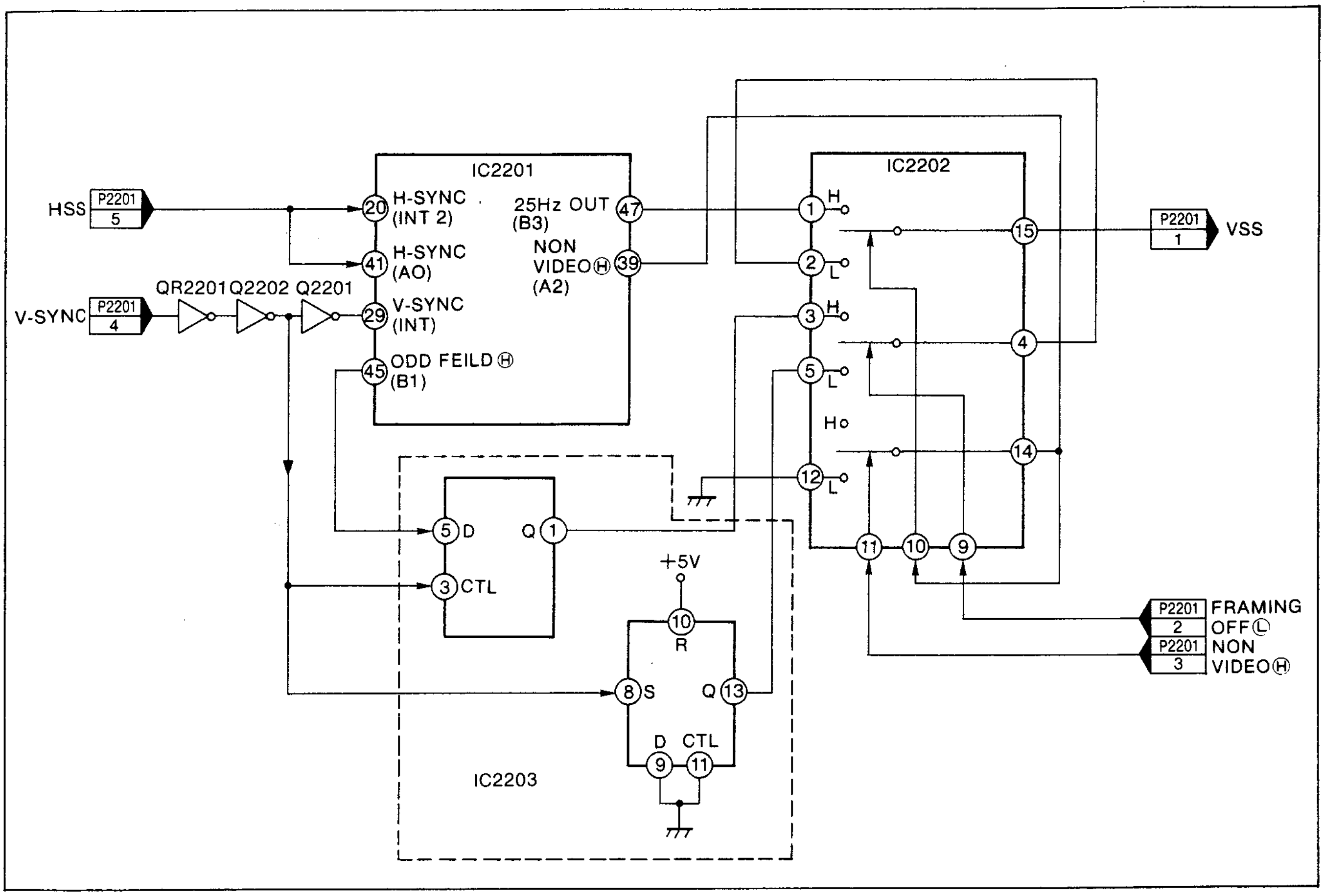

IC2201
HSS
P2201 5
H-SYNC (INT 2)
20
41
H-SYNC (AO)
25Hz OUT (B3)
47
NON VIDEOⒽ (A2)
39
QR2201 Q2202 Q2201
V-SYNC
P2201 4
29
V-SYNC (INT)
45
ODD FEILD Ⓗ (B1)
IC2202
1 H
2 L
3 H
5 L
Ho
12 L
15
4
14
11
10
9
P2201 1
VSS
5 D
Q 1
3 CTL
+5V
10
R
8 S
Q 13
D CTL
9 11
IC2203
P2201 2
FRAMING OFFⓁ
P2201 3
NON VIDEOⒽ

Figure 3—14 Framing Circuit

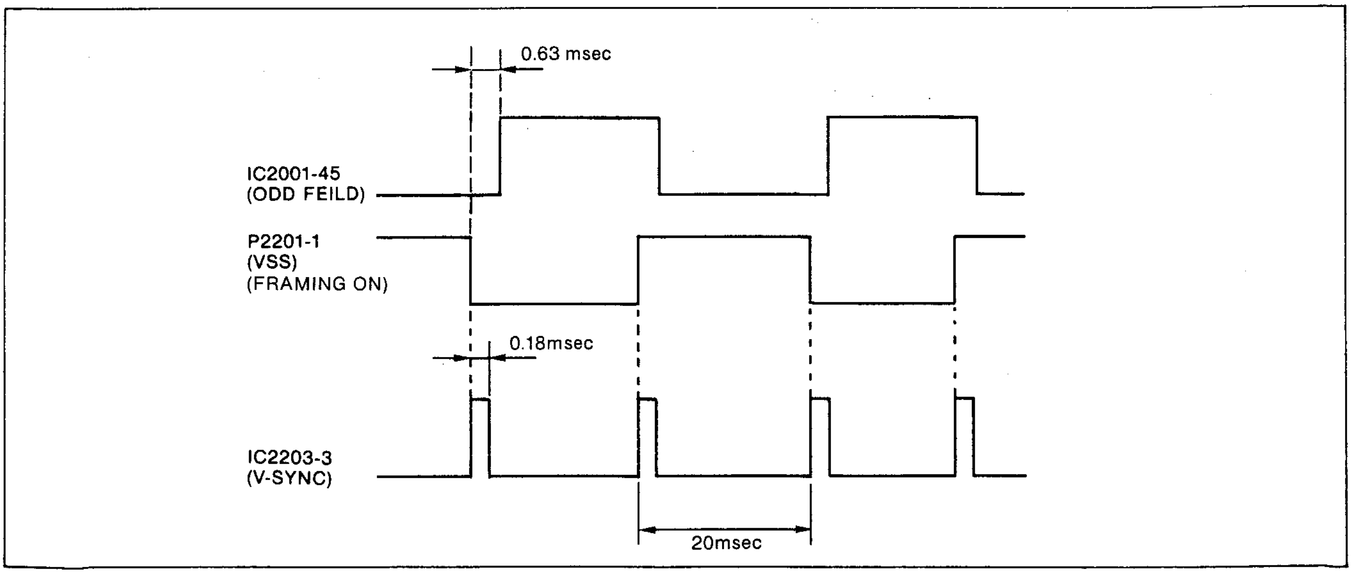


Figure 3—15 Framing Pulse

4. REEL SERVO SECTION

4–1. General Description

The Reel Servo Circuit drives and controls the reel turntables; supply reel table and takeup reel table, by independent direct drive reel motors.

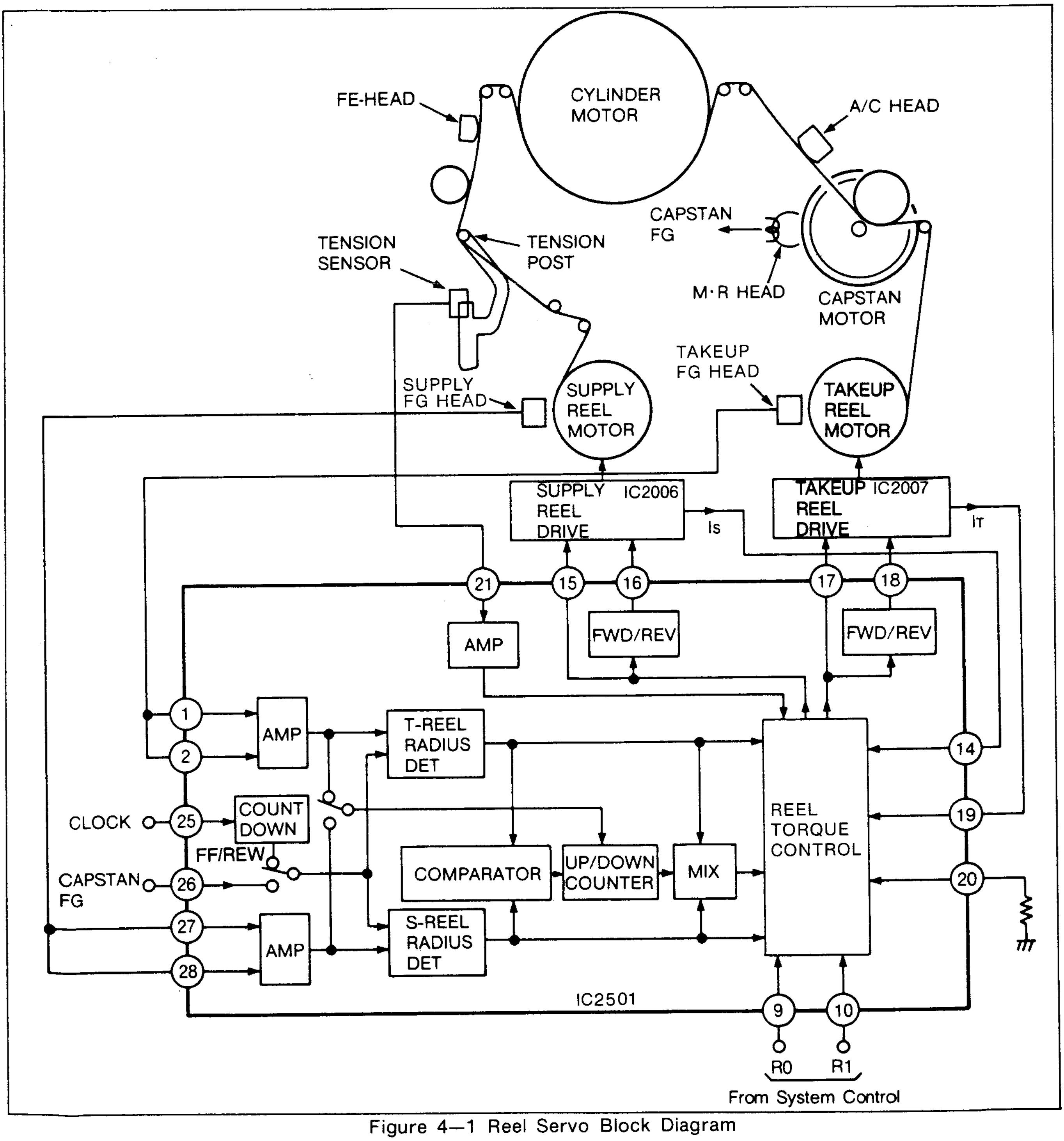
In the conventional models, the capstan motor controls the supply and takeup reel rotation using an changing the direction mechanically using an Idler.

Thus, the reel table's can not be controlled at the same time to keep the tention correct or to avoid the tape loosening.

Furthermore, the conventional models can not keep the tape tension constant, though they control torque constantly. The tape travels under different tape tension because the tape radius will be changed according to the tape position, and it might cause unstabilized pictures.

This model has two independently controlled reel tables, which can be controlled at will.

Furthermore, this reel servo system has tape radius detector which keep the tape tension correct at any time. The simplified block diagram for the reel servo is shown in figure 4–1.



FE-HEAD
CYLINDER MOTOR
A/C HEAD
CAPSTAN FG
TENSION SENSOR
TENSION POST
M·R HEAD
CAPSTAN MOTOR
TAKEUP FG HEAD
SUPPLY FG HEAD
SUPPLY REEL MOTOR
TAKEUP REEL MOTOR
SUPPLY REEL DRIVE IC2006
TAKEUP REEL DRIVE IC2007
Is
IT
21
15
16
17
18
AMP
FWD/REV
FWD/REV
1
2
AMP
T-REEL RADIUS DET
14
CLOCK
25
COUNT DOWN
FF/REW
REEL TORQUE CONTROL
19
CAPSTAN FG
26
COMPARATOR
UP/DOWN COUNTER
MIX
20
27
28
AMP
S-REEL RADIUS DET
IC2501
9
10
R0
R1
From System Control

Figure 4–1 Reel Servo Block Diagram

This circuit consists of the reel servo IC (IC2501) supply reel drive IC (IC2502) and takeup reel drive IC (IC2503).

4–2. Reel Torque Control

For the reel torque control, following signals are supplied to the reel servo IC (IC2501).

1. Tension Sensor Signal (IC2501–21)
2. Capstan FG signal (IC2501–26)
3. Takeup Reel FG signal (IC2501–1, 2)
4. Supply Reel FG signal (IC2501–27, 28)
5. Takeup Reel Motor current (IC2501–19)
6. Supply Reel Motor current (IC2501–14)
7. Mode signal R0, R1 (IC2501–9, 10)

And for the torque control, following signals are supplied to reel motor drive IC's (IC2502 and IC2503) from IC2501.

1. Supply Reel Control current (IC2501–15)
2. Takeup Reel Control current (IC2501–17)
3. Supply Reel Direction signal (IC2501–16)
4. Takeup Reel Direction signal (IC2501–18)

In order to achieve the smooth tape movement in each mode, the supply reel motor and takeup reel motor are driven as described below.

1) Tension Sensor and Tape Tension Control In Play and Search Forward mode

Tape tension should be kept properly and constantly to pick up the video signal from the tape or to keep the steady picture.
The tension sensor detects the tape tension and its signal is applied to the reel Servo IC (IC2501–21) and fed back to control the supply reel motor as shown in Figure 4–2.
The construction of tension sensor is shown in Figure 4–3.
This mechanism has the tension sensor beside the tension arm, and it is a kind of photo interrupter.
During the play or Search Forward Mode, the angle of the tension arm interrupts the light from the LED mounted on the tension sensor unit.
Then the output level of photo transistor in the photo interrupter is varied according to the position of tension arm, which is moved in accord with the tape tension. Finally, the tape tension is converted into electric signal and supplied to IC2501–21 to control the supply reel motor torque.
The supply reel motor torque is changed, keeping the tape tension at constant level.
In play or Search Forward mode, the tension signal from tension sensor is applied to IC2501–21 and processed by buffer, integration circuit and current amplifier. This output is then sent to the supply reel motor to control the torque correctly.
IC2502–16 receives the supply reel torque signal and IC2502–15 receives the supply reel torque direction.

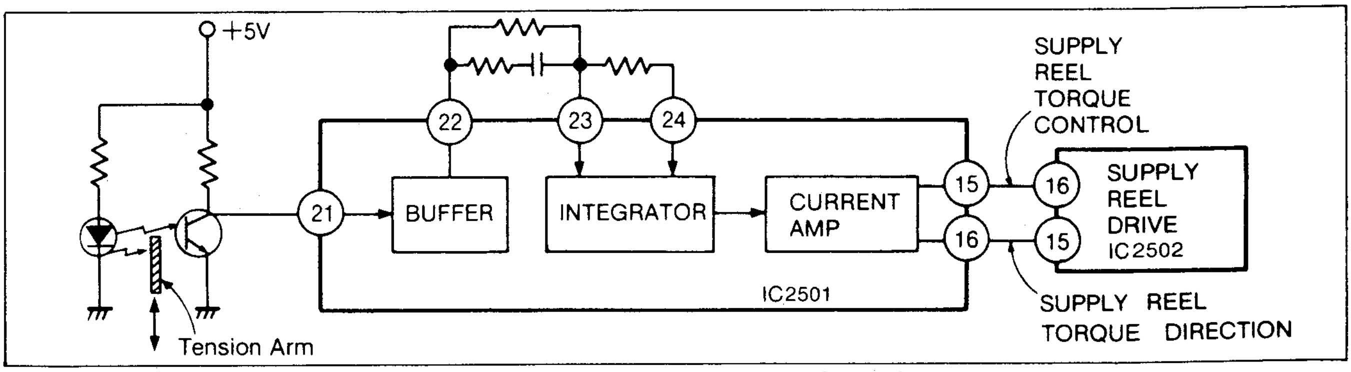

+5V
22
23
24
SUPPLY REEL TORQUE CONTROL
21
BUFFER
INTEGRATOR
CURRENT AMP
15
16
16
15
SUPPLY REEL DRIVE
IC2502
IC2501
Tension Arm
SUPPLY REEL TORQUE DIRECTION

Figure 4–2 Tension Sensor Control

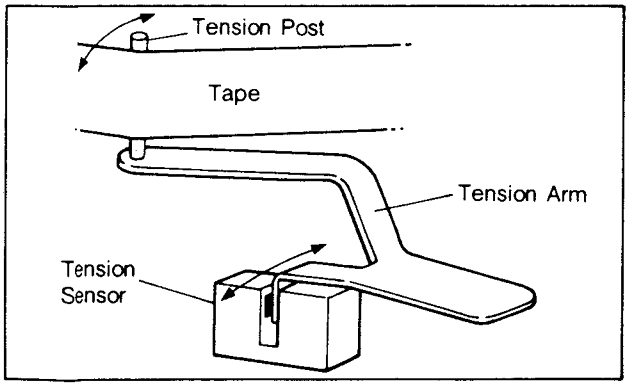

Tension Post
Tape
Tension Arm
Tension Sensor

Figure 4–3 Tension Sensor

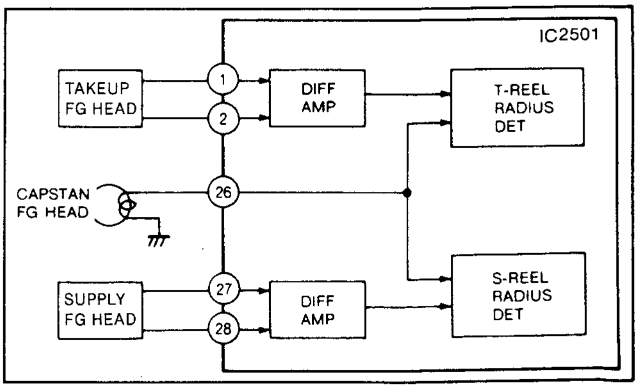

IC2501
TAKEUP FG HEAD
1
2
DIFF AMP
T-REEL RADIUS DET
CAPSTAN FG HEAD
26
SUPPLY FG HEAD
27
28
DIFF AMP
S-REEL RADIUS DET

Figure 4–4 Reel Radius Detector

2) Reel Radius Detection

In play or Search Forward mode, the tape is driven by the capstan motor and the takeup reel has to rotate keeping the tape under steady tension. The takeup reel of the old model winds in such a manner that the torque is constant, therefore, the actual tape tension is changed according to the tape position; in the beginning portion, the reel radius is smaller and the actual wound tape tension might be bigger and not suitable for the play or Search Forward mode.
Reversely, the bigger the reel radius become, the smaller the actual wound tape tension become.
The reel torque should be changed with the reel radius. Detected, on of reel radius is required in order to achieve reel FG uniform tape tension.
Each reel radius is calculated from the reel FG signal. Supply reel FG and takeup reel FG.
Represent the reel rotation speed as follows.
(Capstan Shaft Diameter) X (Capstan Rotation Number)
= (Supply Takeup Wound Reel Radius) X (Supply Reel Rotation Number)
= (Takeup Wound Reel Radius) X (Takeup Reel Rotation Number)
Capstan Rotation Number, Supply Reel Rotation Number and Takeup Reel Rotation Number can be detected by capstan FG frequency, Supply Reel FG Frequency and takeup Reel FG Frequency.
Finally, the following eqatious are required to calculate the reel radius.

$$Ds = (fc/fs)\ \ Ks\ Dc$$

Ds: Supply Reel Radius
fs: Supply FG frequency
Ks: Supply FG Gear Ratio
Dt: Takeup Reel Radius

$$Dt = (fc/ft)\ \ Kt\ Dc$$

ft: Takeup FG frequency
Kt: Takeup FG Gear Ratio
fc: Capstan FG frequency
Dc: Capstan Shaft Radius

Thus, the supply reel radius is determined by the ratio of the capstan FG frequency, while the takeup reel radius is colculated by the capstan FG frequency and the takeup reel FG frequency.
This operation is performed normally in Play, and Search mode, however in Still or Slow mode, the reel radius is held inside of the IC because the tape is stationary, when the Still or Slow mode is released, the held radius is re-used.

3) Filter of Torque Current

In FF/REW mode, the tape moves at high speed and the response of its operation should be rapid. Thus, the response should be changed in accord with the mode. or tape speed by changing characteristics of Filter as shown in Figure.4-5.
In normal playback mode the capacitors C2501 and C2502 at pin 4 of IC2501 work to filter the torque current control of takeup side, which determine its response.
But in FF/REW, and SEARCH mode, "SO" high signal is applied from system control circuit, QR2501 turns off and a capacitor C2502 only is connected, changing the response sensitively.
In FF/REW mode, where "R1" high signal is supplied from system control circuit also, QR2502 turns on and resistors R2502 and R2503 are connected to the ground, therefore, the more sensitive response would be given in FF/REW mode.
On the other hand, two capacitors C2503 and C2504 are connected to supply side in normal playback mode.
In FF/REW mode, "R1" high signal produced from system control circuit is sent to the base of Q2501, turning it off and the capacitor C2504 only is connected to improve the total response in FF/REW mode.
For the detail of "SO" signal and "R1" signal refer to the explanation for system control circuit.

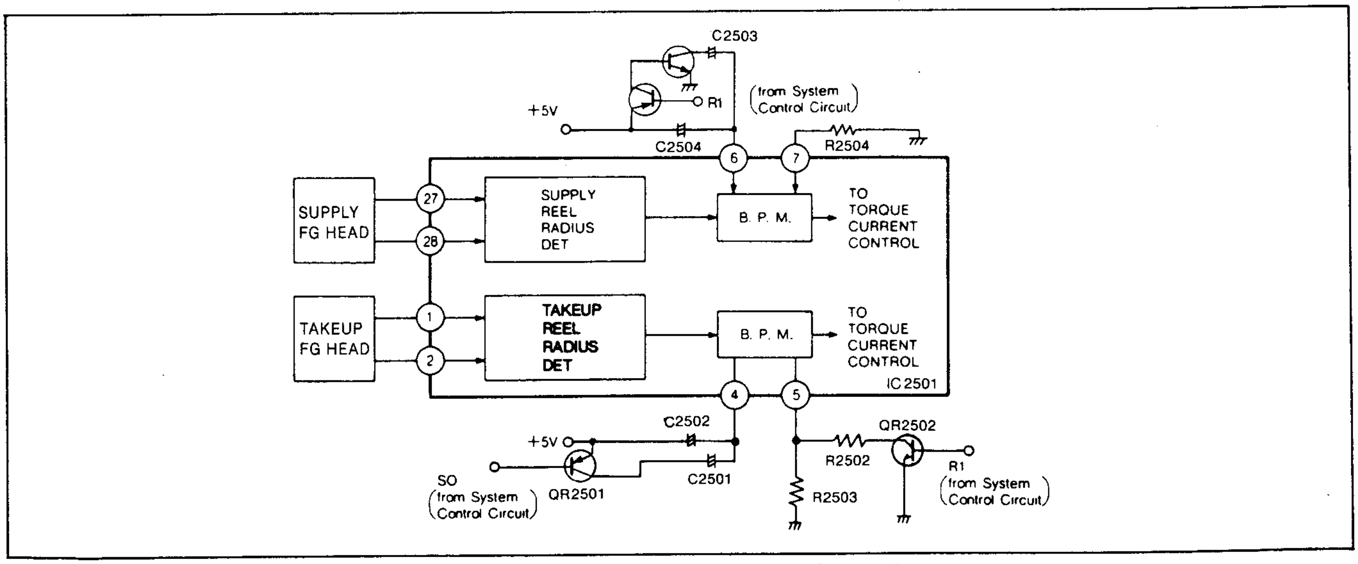


Figure 4—5 Filter of Torque Current

4) Torque Control Selection

The torque control current outputs at pin 15 of IC2501 for supply reel and at pin 17 for takeup reel are determined by the input signals for torque control. As explined before, there are several control methods which are selected according to the mode so as to keep the most suitable condition for its operation and mode instruction data "R0" and "R1" from the system control circuit are used to select them. Refer to Figure 4-5 and Figure 4-6.

R1 R0	L	M	H
L	FWD	REV	FF
M	SLOW/STILL STILL-ADV	SHORT REWIND (REC-PLAY)	BRAKE
H	LOADING	UNLOADING	REW

L: 0V, M: 2V, H: 5V

Figure 4—6 Mode Instruction Data

4-3. Reel Motor Drive

The reel motor also uses a brushless and eight poles direct drive motor as used for the cylinder and capstan motor.

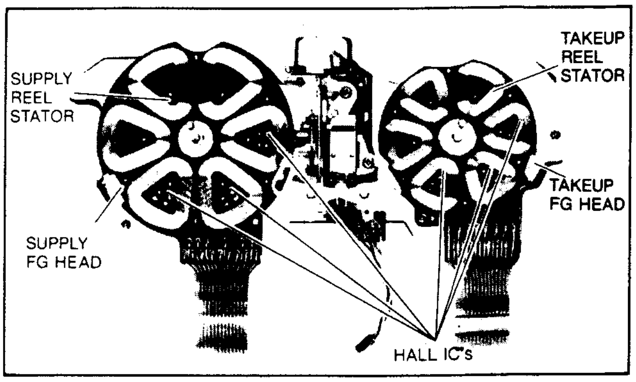

SUPPLY REEL STATOR
TAKEUP REEL STATOR
TAKEUP FG HEAD
SUPPLY FG HEAD
HALL IC's

Figure 4—9 Reel Motor Stator

Motor Mode	Supply Reel Motor	Takeup Reel Motor
PLAY and SEARCH FORWARD	The constant tension is kept by the Tension sensor.	The torque is controlled so as to be in proportion to the radius of the takeup reel.
SEARCH REVERSE	The torque is controlled so as to be in proportion to the radius of the supply reel.	The torque is controlled so as to be in proportion to the radius of the takeup reel.
FF	The torque is controlled according to the takeup reel motor current.	The speed control of the takeup reel motor is performed so that the sum of the torques of both reel motors is constant.
REW	The speed control of the supply reel motor is performed so that the sum of the torques of both reel motors in constant.	The torque is controlled according to the supply reel motor current.
SLOW	The same as PLAY mode.	The same as PLAY mode. But the reel radius data is kept at the previous data.
Loading	The back tension is applied by the constant torque.	Mechanical Lock.
Unloading	The back tension is applied by the constant torque.	Mechanical Lock.
Brake	FF mode: Counter Clockwise Torque REW mode: Clockwise Torque	FF mode: Counter Clockwise Torque REW mode: Clockwise Torque

Figure 4—7 Torque Control in Each Mode

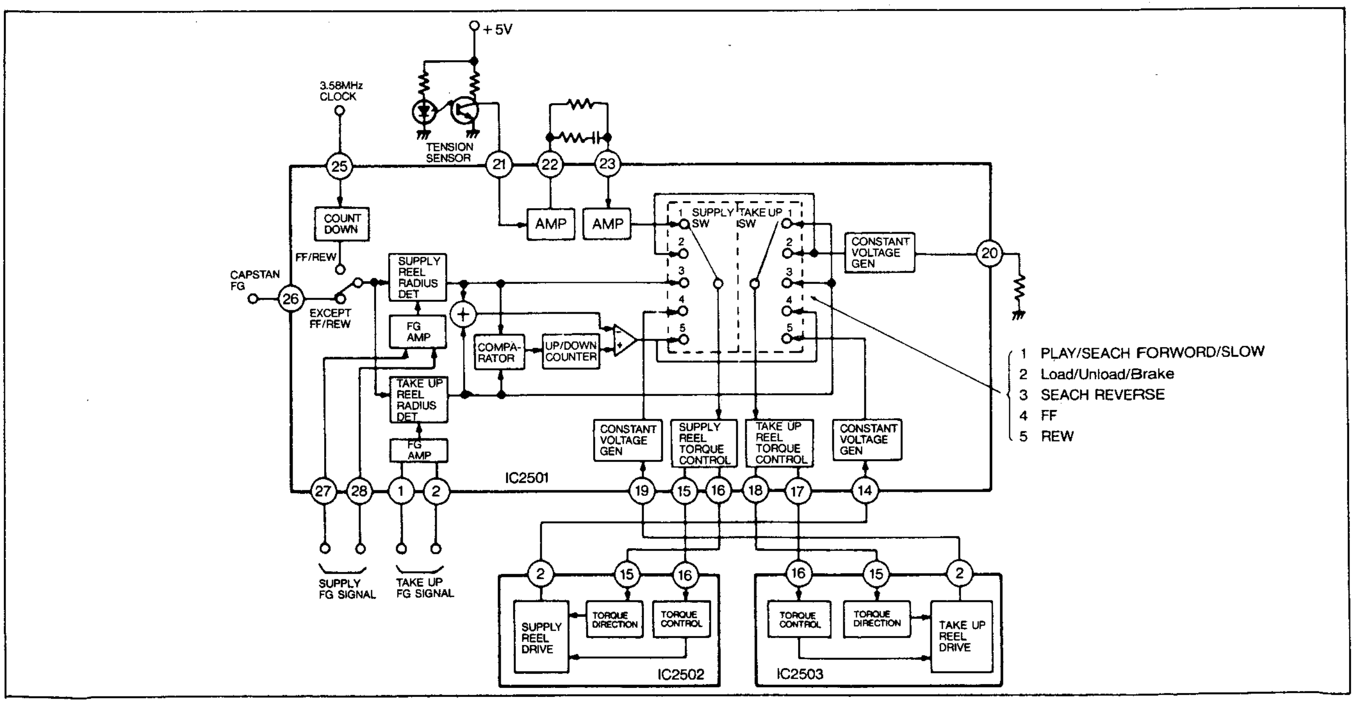

+5V
3.58MHz CLOCK
TENSION SENSOR
25
21
22
23
COUNT DOWN
AMP
AMP
1 SUPPLY SW
TAKE UP SW 1
2
3
4
5
CONSTANT VOLTAGE GEN
20
FF/REW
CAPSTAN FG
26
EXCEPT FF/REW
SUPPLY REEL RADIUS DET
FG AMP
COMPA-RATOR
UP/DOWN COUNTER
TAKE UP REEL RADIUS DET
FG AMP
CONSTANT VOLTAGE GEN
SUPPLY REEL TORQUE CONTROL
TAKE UP REEL TORQUE CONTROL
CONSTANT VOLTAGE GEN
IC2501
27
28
1
2
19
15
16
18
17
14
SUPPLY FG SIGNAL
TAKE UP FG SIGNAL
2
15
16
SUPPLY REEL DRIVE
TORQUE DIRECTION
TORQUE CONTROL
IC2502
16
15
2
TORQUE CONTROL
TORQUE DIRECTION
TAKE UP REEL DRIVE
IC2503
1 PLAY/SEACH FORWORD/SLOW
2 Load/Unload/Brake
3 SEACH REVERSE
4 FF
5 REW

Figure 4—8 Torque Control Block Diagram

5. VIDEO SECTION

Circuit Explanation

5-1 Higher White Clip Circuit

The white clip level has been raised as shown Figure 5-1, to produce crisper, sharper images.

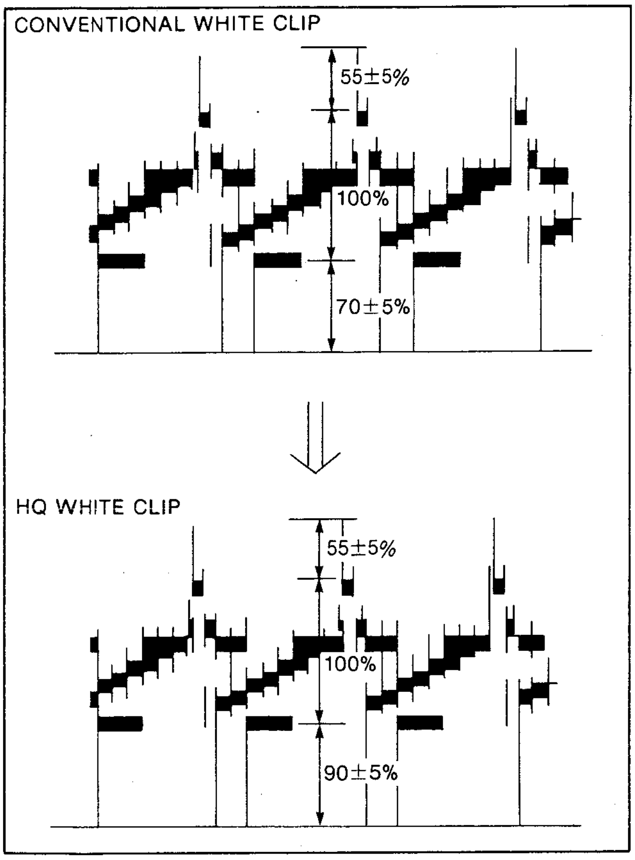


Figure 5—1 White Clip

5-2 Detail Enhancer

This circuit is adapted to the Luminance recording circuit.

The Detail Enhancer Circuit emphasizes the incoming luminance signal in accordance with specific characteristics in order to realize the small details in the playback picture.
The characteristic of the Detail Enhancer is shown in Figure 5-2.
The Detail Enhancer circuit mainly consists of a low pass filter, differential amplifier, suppressor amplifier, clip and mixer circuits.
In the recording mode, the Luminance signal is split into three paths and fed to the Detail Enhance circuit. One of the Luminance signal is applied to the MIX circuit through the high frequency compensator (R3033, and C3028) and Delay line (FL3002) which delays by 150 nsec.

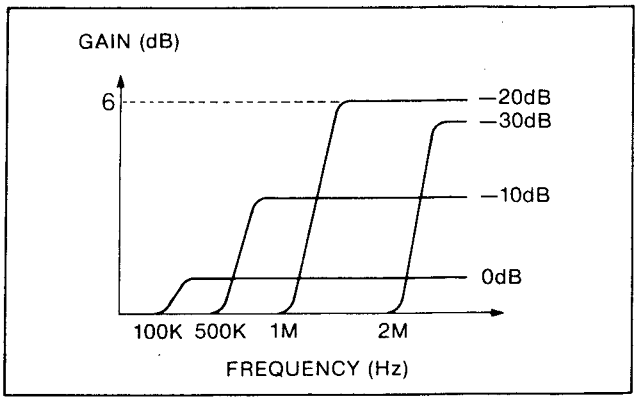


Figure 5—2 Characteristics of the Detail Enhancer

The Delay line (FL3002) is especially used to delay the video signal in order to match the timing of the other signals. The time delay is created by the low pass filter (C3021, C3023 and L3007). The time delay of the low pass filter is Approx. 0.1usec. This signal is fed to pin 2 of IC3002. On the other hand, this signal is reflected because this low pass filter is not terminated and mixed with the original signal and fed to pin 1 of IC3002.
In this way, the Luminance signal according to the network characteristics produces two signals (a) and (b) as shown in Figure 5-3.
Then, both of them are supplied to the differential amplifier after filtering through the L.P.F. The differential amplifier subtracts the filtered Luminance signal (b) from (a).
As a result, the output signal contains only high frequency Luminance components (c). The high frequency Luminance components are then sent to the suppressor amplifier. The characteristic of input/output for the Suppressor amplifier is shown in Figure 5-4.

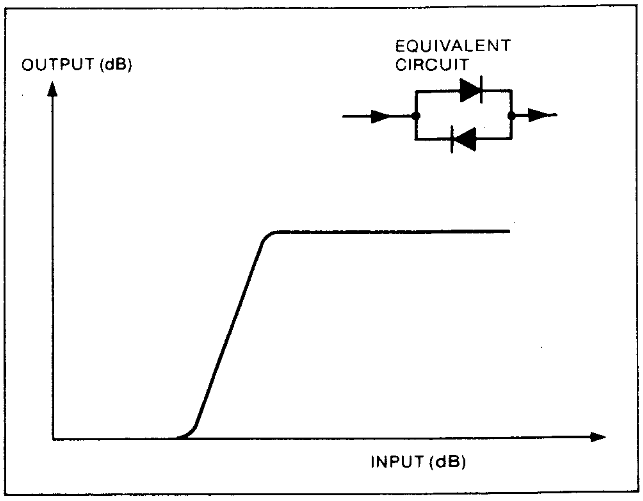


Figure 5—4 Characteristic of input/output for the Suppressor Amplifier

This Suppressor operates to cancel the noise portion whose gain is around −30dB.
Then the signal whose noise is extracted is applied to the clip circuit to cut off the high frequency Luminance signal to the proper level and is fed to the amplifier. The amplifier determines the emphasis amount, that is controlled by the VR3002.

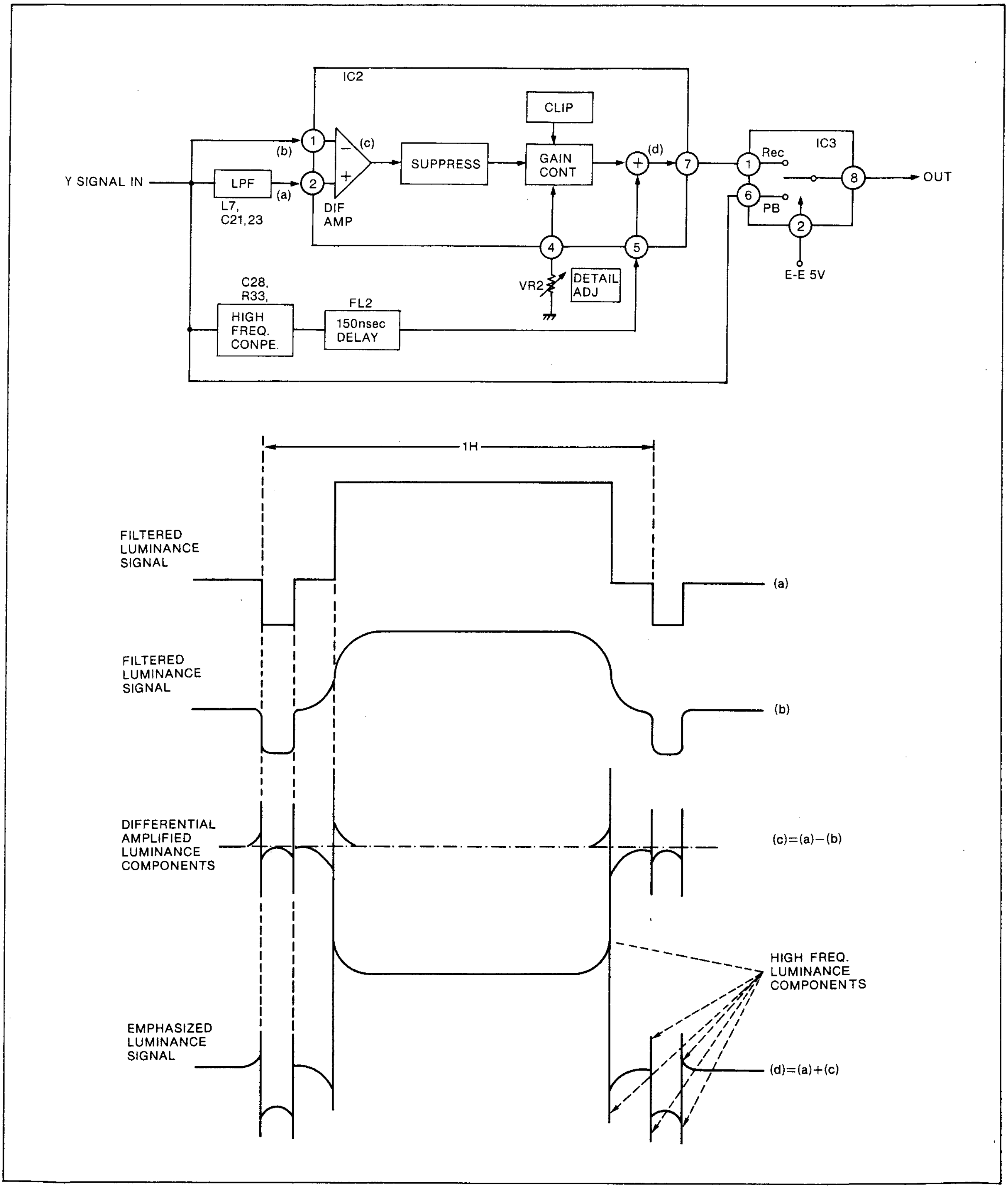

IC2
CLIP
(b)
1
(c)
SUPPRESS
GAIN CONT
(d)
7
Y SIGNAL IN
LPF
2
(a)
L7, C21,23
DIF AMP
4
5
IC3
Rec
1
8
OUT
6
PB
2
E-E 5V
C28, R33,
HIGH FREQ. CONPE.
FL2
150nsec DELAY
VR2
DETAIL ADJ
1H
FILTERED LUMINANCE SIGNAL
(a)
FILTERED LUMINANCE SIGNAL
(b)
DIFFERENTIAL AMPLIFIED LUMINANCE COMPONENTS
(c)=(a)−(b)
HIGH FREQ. LUMINANCE COMPONENTS
EMPHASIZED LUMINANCE SIGNAL
(d)=(a)+(c)

Figure 5—3 Detail Enhancer

5–3. Head Switching Circuit

For good picture quality, 4 different video heads are used in this model as shown in Figure 5–5 and 5–6.

	REC	PLAY BACK			
		NORMAL	STILL	SLOW	SEARCH
USED HEAD	RL	RL	L′L″	RL′L″	RL
HEAD AMP SW	L	L	H	—	L

Figure 5—6 Head Switching Function Table

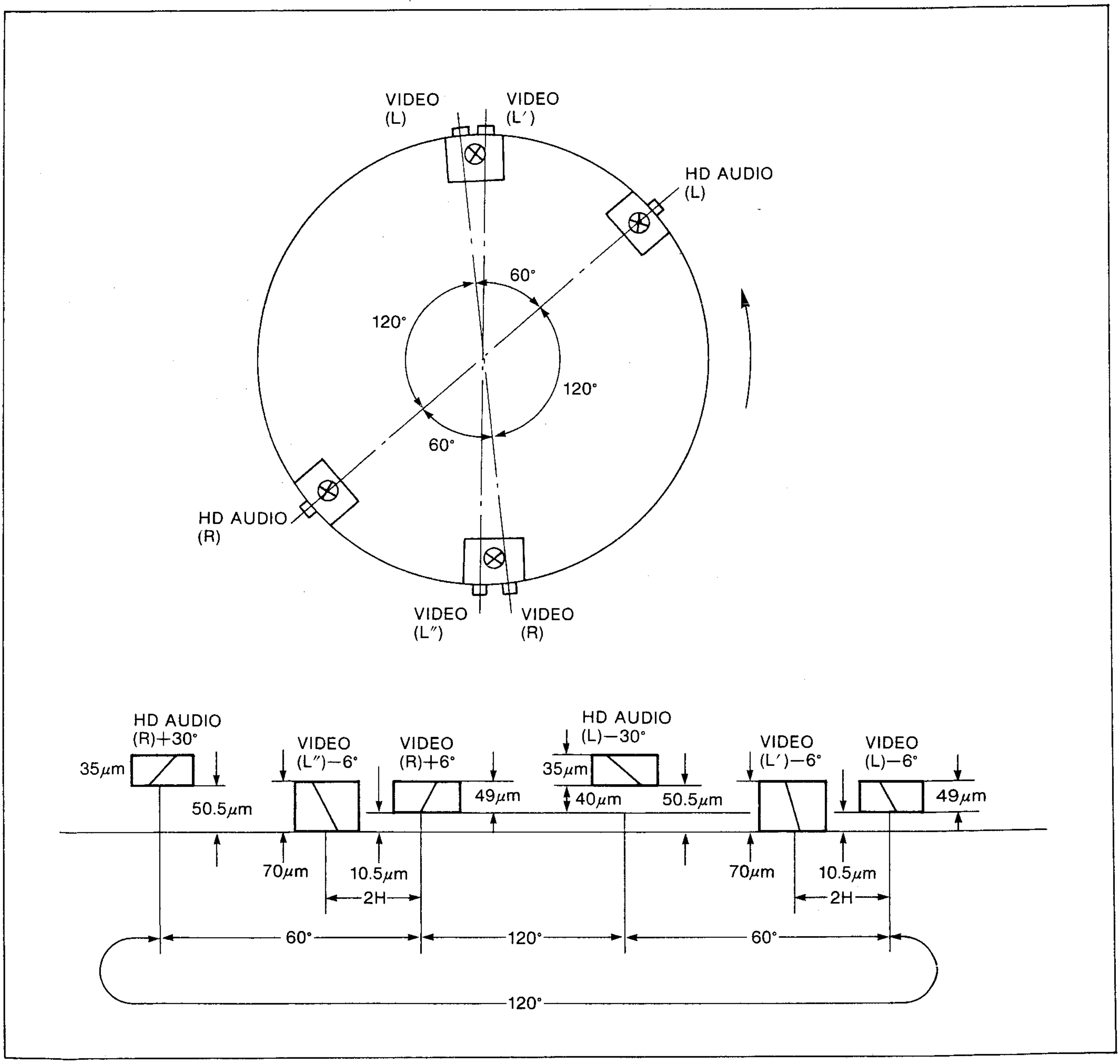

VIDEO (L)
VIDEO (L′)
HD AUDIO (L)
60°
120°
120°
60°
HD AUDIO (R)
VIDEO (L″)
VIDEO (R)
HD AUDIO (R)+30°
35μm
50.5μm
VIDEO (L″)−6°
70μm
VIDEO (R)+6°
10.5μm
2H
49μm
HD AUDIO (L)−30°
35μm
40μm
50.5μm
VIDEO (L′)−6°
70μm
VIDEO (L)−6°
10.5μm
2H
49μm
60°
120°
60°
120°

Figure 5—5 Upper Cylinder Unit

6. AUDIO SECTION

Since the Channel 2 Audio Signal flow is identical to the Channel 1 Signal flow, only the circuit explanation of the Channel 1 Audio Signal is described in this section.

6-1. AUDIO INPUT SELECT CIRCUIT

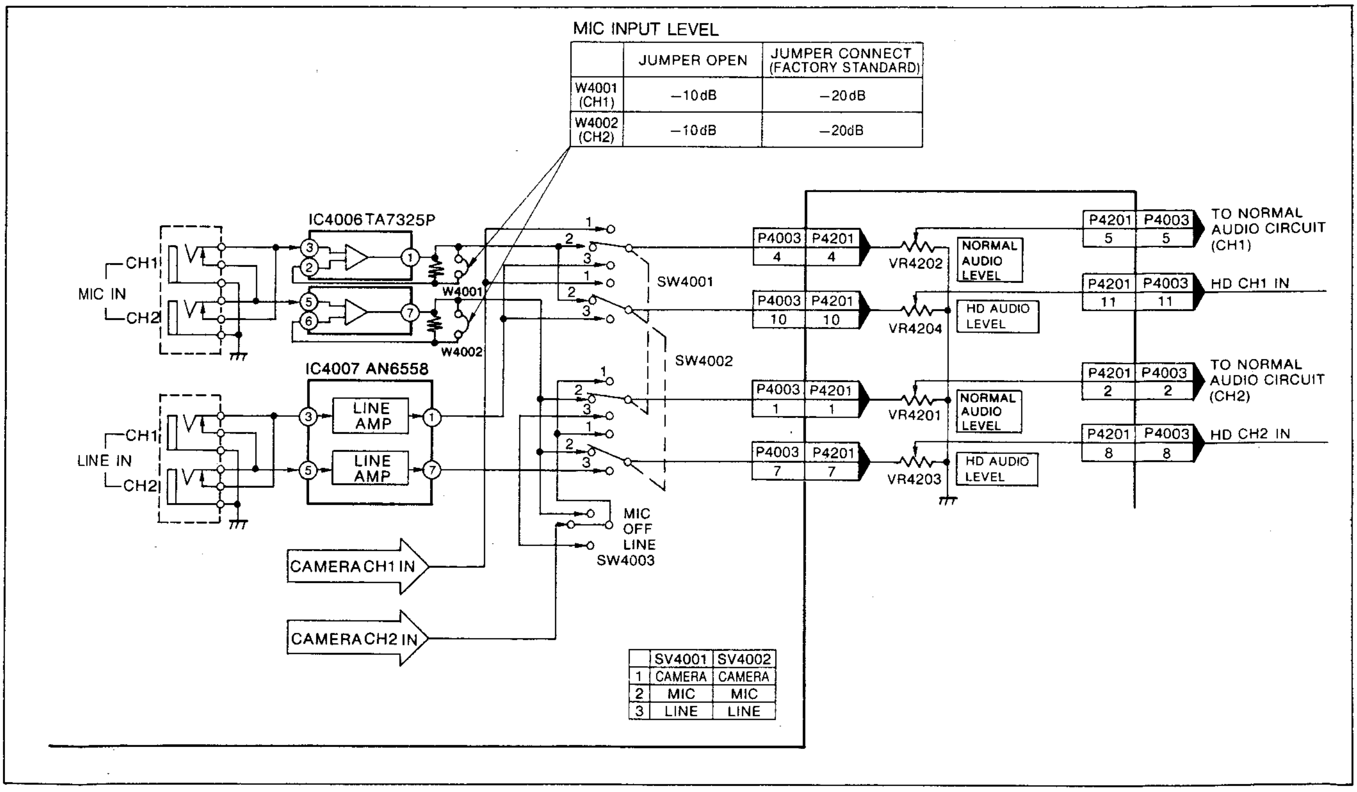
There are three audio Inputs on the right side of the unit. (Refer to Figure 6-1)

(A) Input Signal from the MICROPHONE
(B) Input Signal from the LINE IN (Phono Jack)
(C) Input Signal from the CAMERA 10P Jack

(A) Input Signal from the Microphone
If a microphone is connected to the CH1 jack, the signal is sent to pin 1 of IC4006 and amplified.
The amplified signal appears at pin 3 of IC4006 and goes to AUDIO IN SELECT as shown in Figure 6-1. The AUDIO IN SELECT consists of NORMAL and HD individual swithes. So a maximum four different audio sounds can be recorded on the Normal. Audio Tracks and HD Sound Tracks.
The CH1 Signal is then sent to the NORMAL AUDIO LEVEL CONTROL VR4002 to adjust the recording level.

(B) Input signal from the LINE IN (Phono Jack).
The signal is first sent to the amplifier inside of IC4007. If the AUDIO SELECT SW is turned to the position of LINE (Pin 3 of SW 4001), the signal is sent to the NORMAL AUDIO LEVEL CONTROL VR4202.

(C) Input signal from the CAMERA Jack
If the camera built in the stereo microphones are connected to the 10 PIN CONNECTOR, the CH1 signal is applied to the AUDIO SELECT SW via pin 7 of the 10 Pin Connector. If the monaural microphone, only the CH1 signal is applied to the AUDIO SELECT SW via pin 7 of the 10Pin Connector. Then CH2 recording signal is selected MIC, LINE or OFF by the Camera External Select SW.



MIC INPUT LEVEL

	JUMPER OPEN	JUMPER CONNECT (FACTORY STANDARD)
W4001 (CH1)	−10dB	−20dB
W4002 (CH2)	−10dB	−20dB

	SV4001	SV4002
1	CAMERA	CAMERA
2	MIC	MIC
3	LINE	LINE

IC4006TA7325P
CH1
MIC IN
CH2
W4001
W4002
IC4007 AN6558
LINE AMP
LINE AMP
CH1
LINE IN
CH2
SW4001
SW4002
MIC
OFF
LINE
SW4003
CAMERA CH1 IN
CAMERA CH2 IN
P4003
P4201
VR4202
NORMAL AUDIO LEVEL
VR4204
HD AUDIO LEVEL
VR4201
VR4203
TO NORMAL AUDIO CIRCUIT (CH1)
HD CH1 IN
TO NORMAL AUDIO CIRCUIT (CH2)
HD CH2 IN

Figure 6—1 Audio Input Select Circuit

6-2. HD AUDIO

Introduction

The "HD(Hi-Fi)" sound recording system frequency modulates the audio signal then records them onto the video track through 2 HD audio heads mounted on the video head cylinder.

The audio signal for the channel 1 will be FM modulated onto a 1.4MHz carrier, while the channel 2 will be FM modulated onto a 1.8MHz carrier. Each channel uses a frequency deviation of +− 100kHz.

A simplified block diagram for the Hi-Fi audio recording process is shown in Figure 6-2.

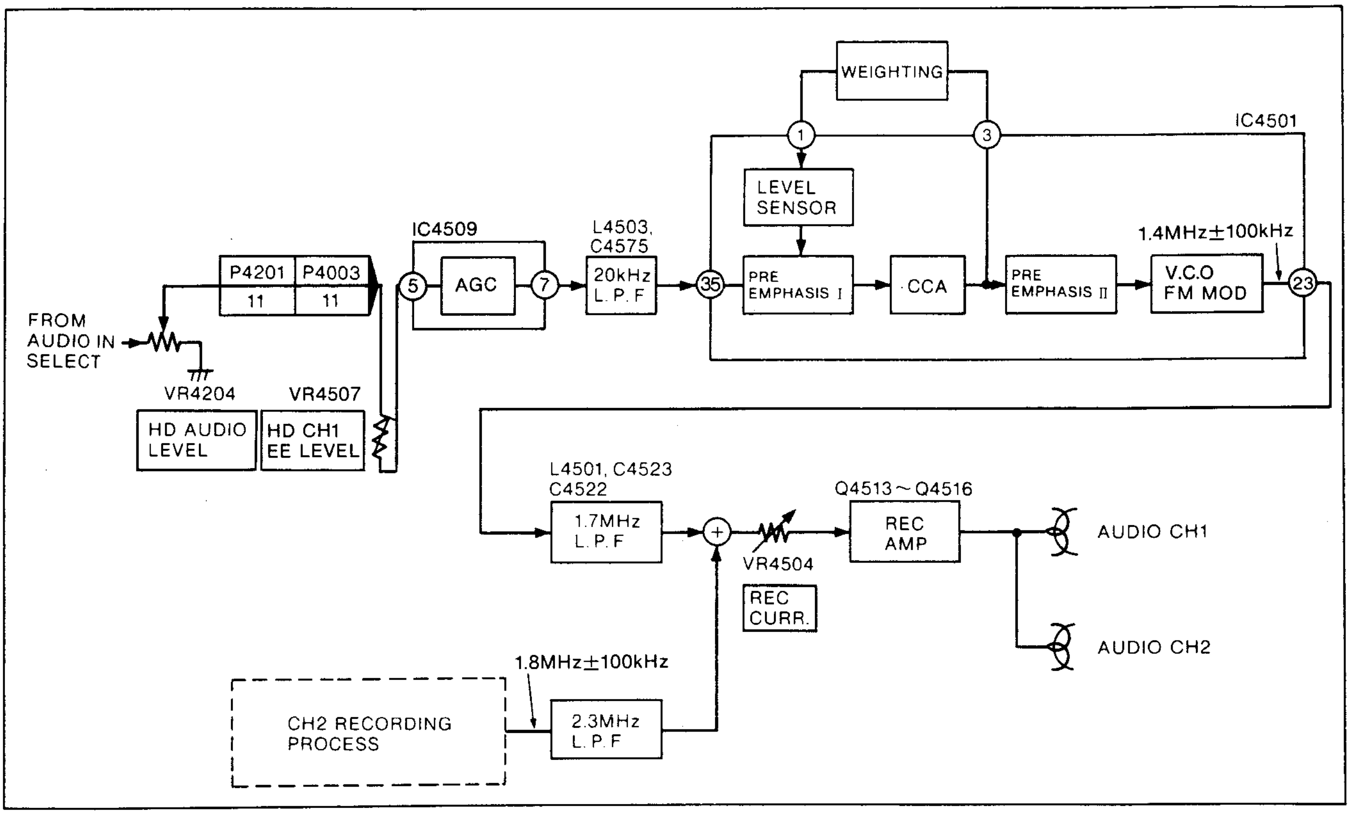

WEIGHTING
IC4501
1
3
LEVEL SENSOR
1.4MHz±100kHz
IC4509
L4503, C4575
P4201
P4003
11
11
5
AGC
7
20kHz L.P.F
35
PRE EMPHASIS I
CCA
PRE EMPHASIS II
V.C.O FM MOD
23
FROM AUDIO IN SELECT
VR4204
VR4507
HD AUDIO LEVEL
HD CH1 EE LEVEL
L4501, C4523 C4522
Q4513~Q4516
1.7MHz L.P.F
+
REC AMP
AUDIO CH1
VR4504
REC CURR.
AUDIO CH2
1.8MHz±100kHz
CH2 RECORDING PROCESS
2.3MHz L.P.F

Figure 6—2 Simplified Block Diagram of Hi-Fi Audio Recording Process (CH1 Shown)

A simplified block diagram for the Hi-Fi audio playback process is shown in Figure 6—3.

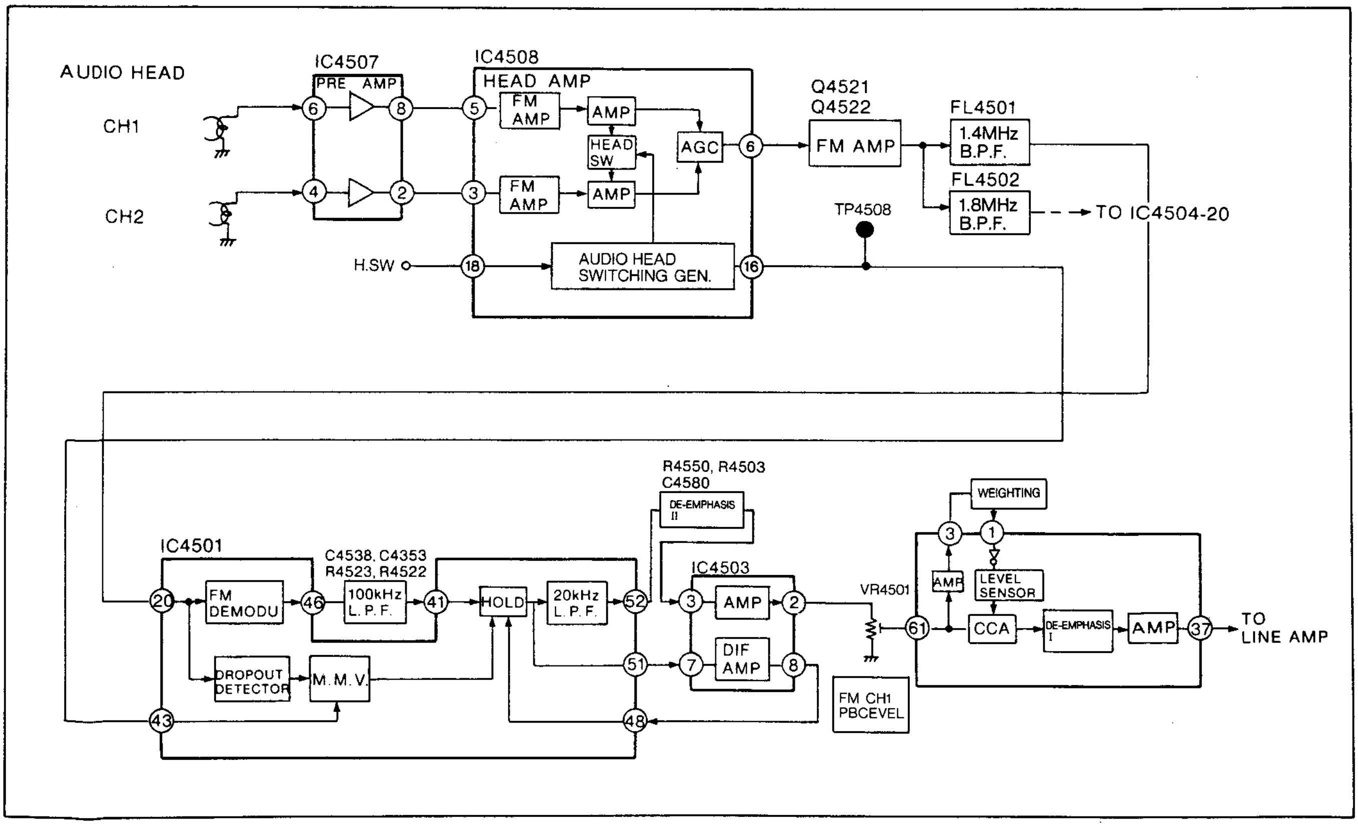

AUDIO HEAD
CH1
CH2
IC4507
PRE AMP
6
8
4
2
IC4508
HEAD AMP
5
FM AMP
AMP
HEAD SW
AGC
6
3
FM AMP
AMP
H.SW
18
AUDIO HEAD SWITCHING GEN.
16
Q4521 Q4522
FM AMP
FL4501
1.4MHz B.P.F.
FL4502
1.8MHz B.P.F.
TO IC4504-20
TP4508
R4550, R4503 C4580
DE-EMPHASIS II
WEIGHTING
IC4501
C4538, C4353 R4523, R4522
20
FM DEMODU
46
100kHz L.P.F.
41
HOLD
20kHz L.P.F.
52
IC4503
3
AMP
2
VR4501
3
1
AMP
LEVEL SENSOR
61
CCA
DE-EMPHASIS I
AMP
37
TO LINE AMP
DROPOUT DETECTOR
M.M.V.
51
7
DIF AMP
8
FM CH1 PBCEVEL
43
48

Figure 6— 3 Hi-Fi Audio Playback Process

6-3. NORMAL AUDIO CIRCUIT

1) Time Code In / Out Circuit

When the Time Code Generator / Reader is connected to the Time Code In / Out Jack, Time Code signal can be recorded or played back on CH2 normal audio track. This Jack takes priority to the normal audio CH2 input jack. This is done by the Relay RY4001.

2) Audio Output Circuit

The block diagram of audio output select circuit is shown in Figure 6-6.

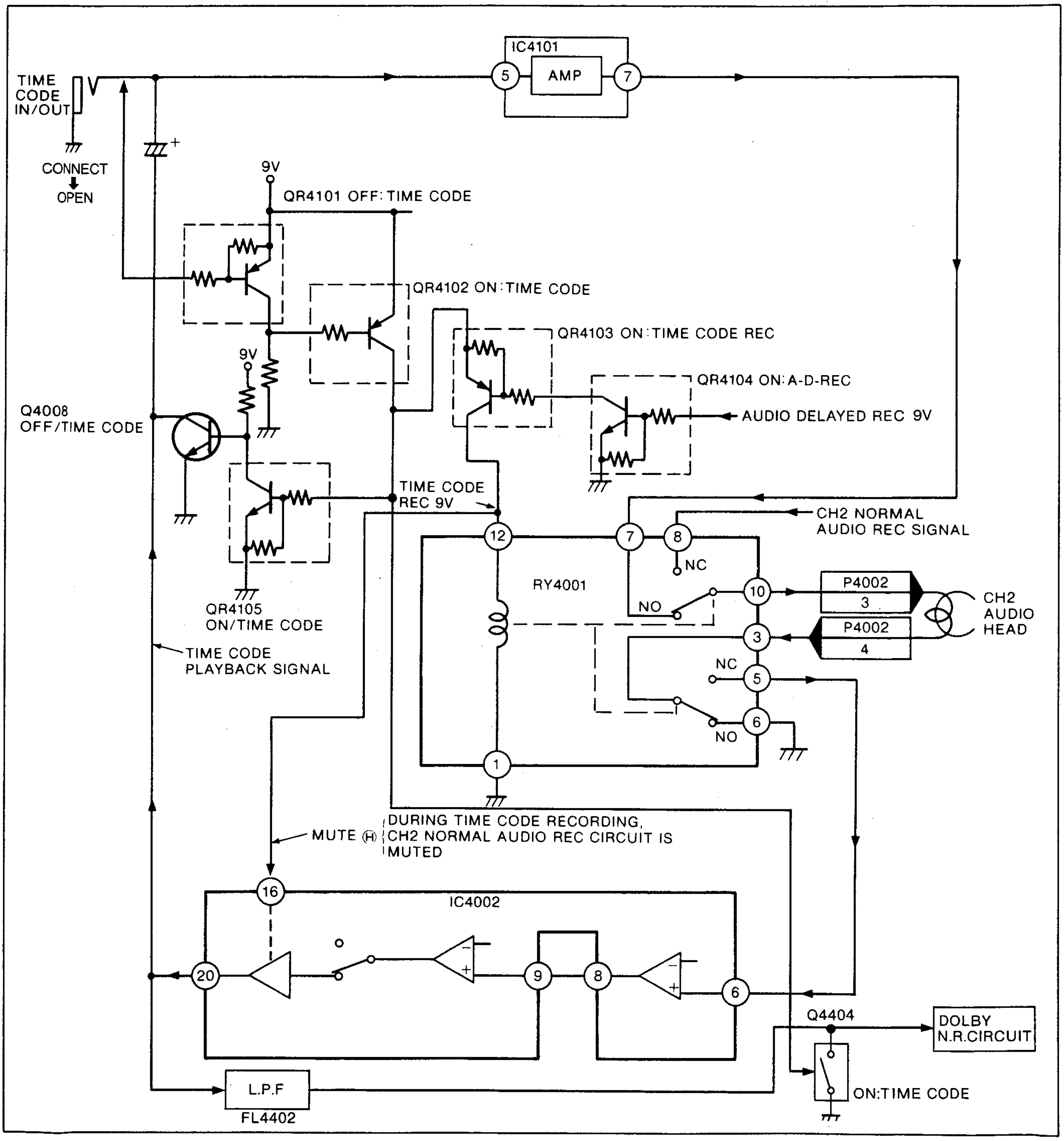

TIME CODE IN/OUT
CONNECT
OPEN
IC4101
AMP
5
7
9V
QR4101 OFF: TIME CODE
QR4102 ON: TIME CODE
QR4103 ON: TIME CODE REC
QR4104 ON: A-D-REC
AUDIO DELAYED REC 9V
9V
Q4008
OFF/TIME CODE
QR4105
ON/TIME CODE
TIME CODE REC 9V
TIME CODE PLAYBACK SIGNAL
CH2 NORMAL AUDIO REC SIGNAL
RY4001
12
7
8
NC
NO
10
3
5
6
1
NC
NO
P4002
3
P4002
4
CH2 AUDIO HEAD
MUTE Ⓗ
DURING TIME CODE RECORDING, CH2 NORMAL AUDIO REC CIRCUIT IS MUTED
IC4002
16
20
9
8
6
Q4404
DOLBY N.R.CIRCUIT
ON:TIME CODE
L.P.F
FL4402

Figure 6—4 Time Code In/Out Circuit

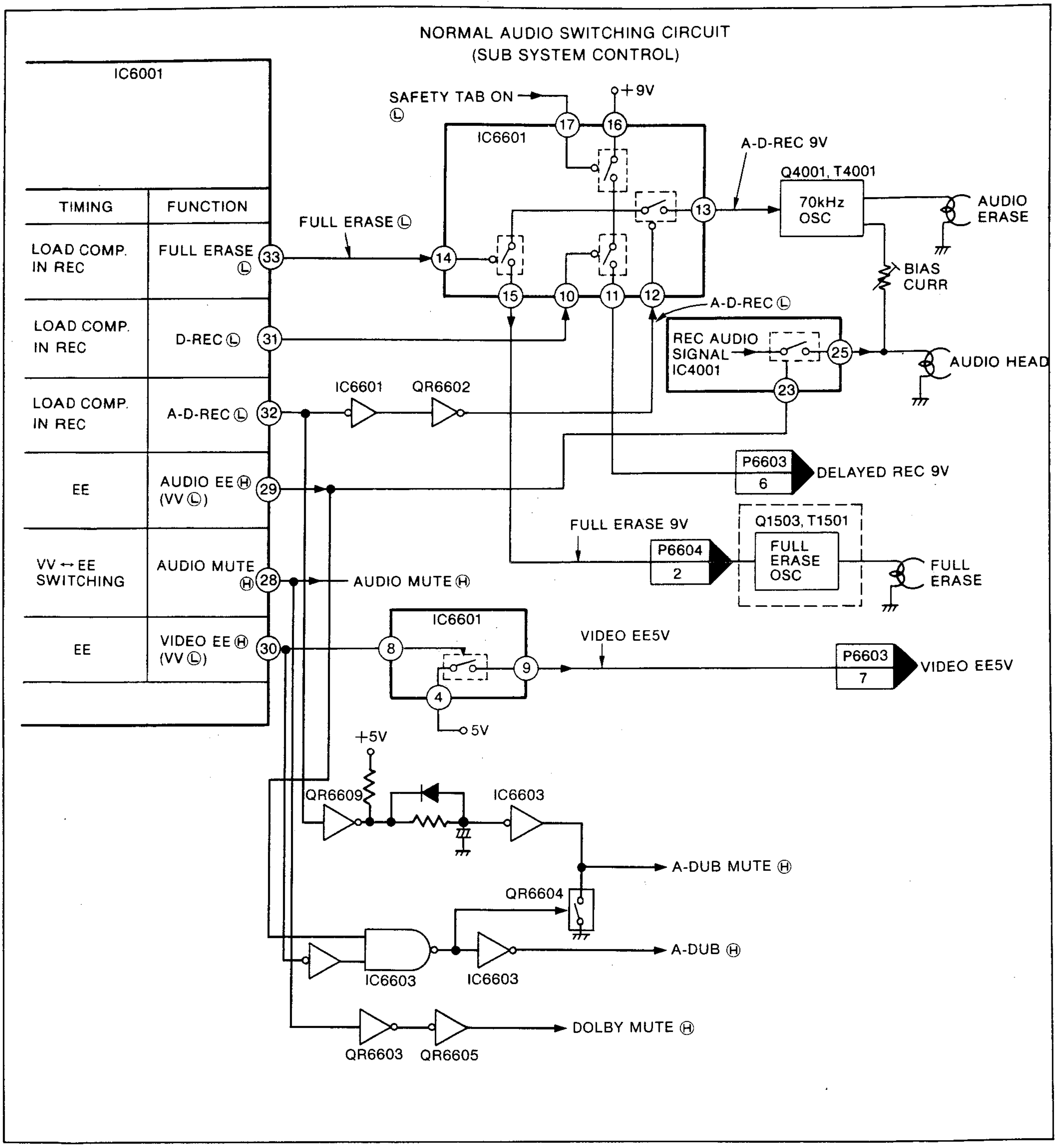
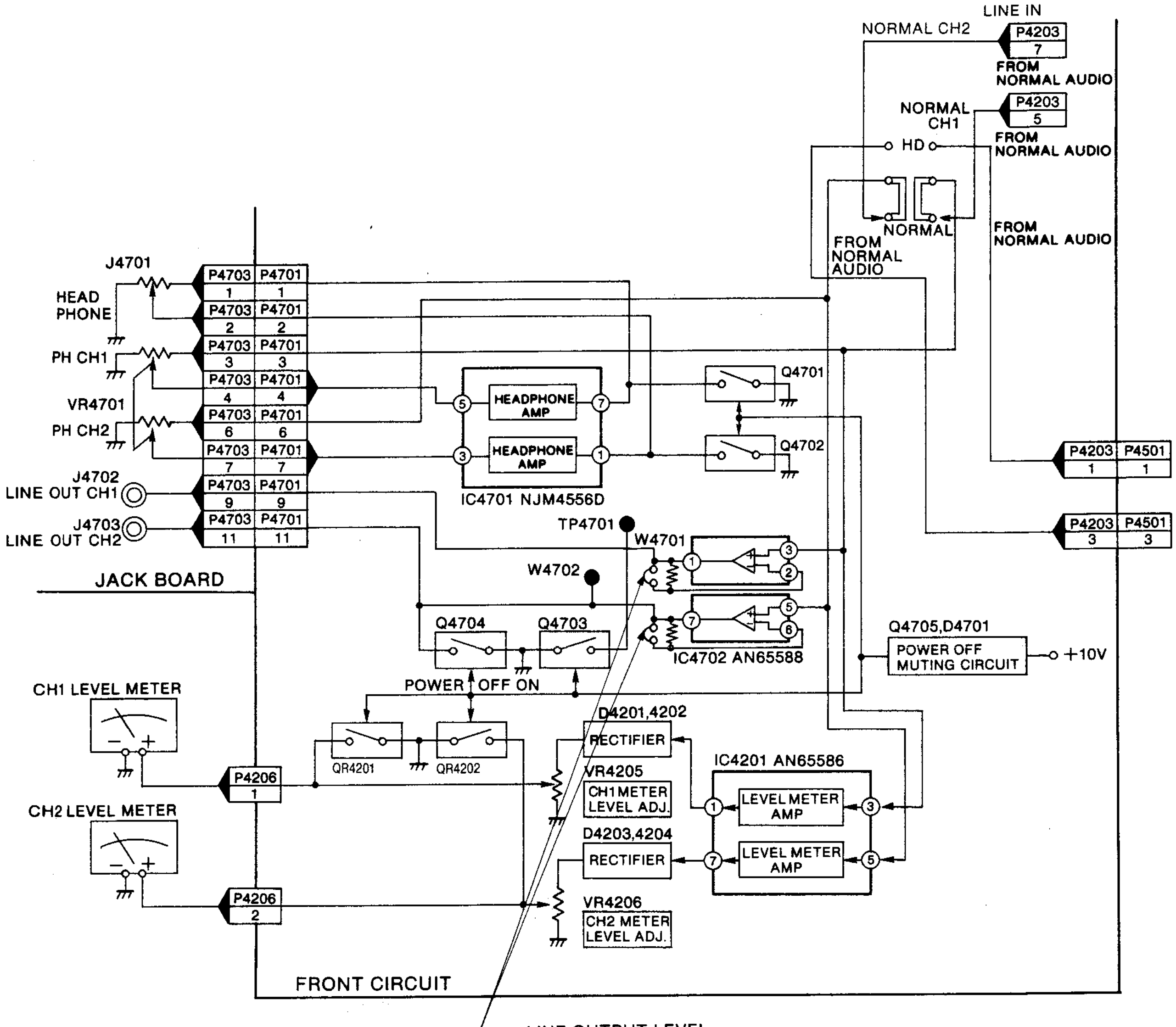

NORMAL AUDIO SWITCHING CIRCUIT
(SUB SYSTEM CONTROL)
IC6001
TIMING
FUNCTION
LOAD COMP. IN REC
FULL ERASE Ⓛ
33
LOAD COMP. IN REC
D-REC Ⓛ
31
LOAD COMP. IN REC
A-D-REC Ⓛ
32
EE
AUDIO EE Ⓗ (VV Ⓛ)
29
VV ↔ EE SWITCHING
AUDIO MUTE Ⓗ
28
EE
VIDEO EE Ⓗ (VV Ⓛ)
30
SAFETY TAB ON Ⓛ
+9V
17
16
IC6601
A-D-REC 9V
Q4001, T4001
70kHz OSC
AUDIO ERASE
FULL ERASE Ⓛ
13
14
15
10
11
12
BIAS CURR
A-D-REC Ⓛ
REC AUDIO SIGNAL
IC4001
25
23
AUDIO HEAD
IC6601
QR6602
P6603
6
DELAYED REC 9V
FULL ERASE 9V
Q1503, T1501
P6604
2
FULL ERASE OSC
FULL ERASE
AUDIO MUTE Ⓗ
IC6601
8
9
4
5V
VIDEO EE5V
P6603
7
VIDEO EE5V
+5V
QR6609
IC6603
A-DUB MUTE Ⓗ
QR6604
A-DUB Ⓗ
IC6603
IC6603
DOLBY MUTE Ⓗ
QR6603
QR6605

Figure 6—5 Normal Audio Switching Circuit


LINE IN
NORMAL CH2
P4203
7
FROM NORMAL AUDIO
NORMAL CH1
P4203
5
HD
FROM NORMAL AUDIO
FROM NORMAL AUDIO
NORMAL
FROM NORMAL AUDIO
J4701
HEAD PHONE
PH CH1
VR4701
PH CH2
J4702
LINE OUT CH1
J4703
LINE OUT CH2
P4703 P4701
1 1
2 2
3 3
4 4
6 6
7 7
9 9
11 11
JACK BOARD
HEADPHONE AMP
HEADPHONE AMP
IC4701 NJM4556D
Q4701
Q4702
P4203 P4501
1 1
P4203 P4501
3 3
TP4701
W4701
W4702
IC4702 AN65588
Q4704
Q4703
POWER OFF ON
Q4705,D4701
POWER OFF MUTING CIRCUIT
+10V
CH1 LEVEL METER
CH2 LEVEL METER
QR4201
QR4202
P4206
1
P4206
2
D4201,4202
RECTIFIER
VR4205
CH1 METER LEVEL ADJ.
IC4201 AN65586
LEVEL METER AMP
LEVEL METER AMP
D4203,4204
RECTIFIER
VR4206
CH2 METER LEVEL ADJ.
FRONT CIRCUIT

LINE OUTPUT LEVEL

	JUMPER OPEN	JUMPER CONNECT (FACTORY STANDARD)
W4701 (CH1)	−8 dB	−6 dB
W4702 (CH2)	−8 dB	−6 dB

Figure 6—6 Block Diagram of Audio Output Select Circuit

〈NOTE〉

REGULAR MAINTENANCE

The purpose of periodic maintenance is to preserve the functioning of this machine throughout it's useful life. The user or service dealer should perform these maintenance regularly to ensure that maximum utility is obtained from the machine.

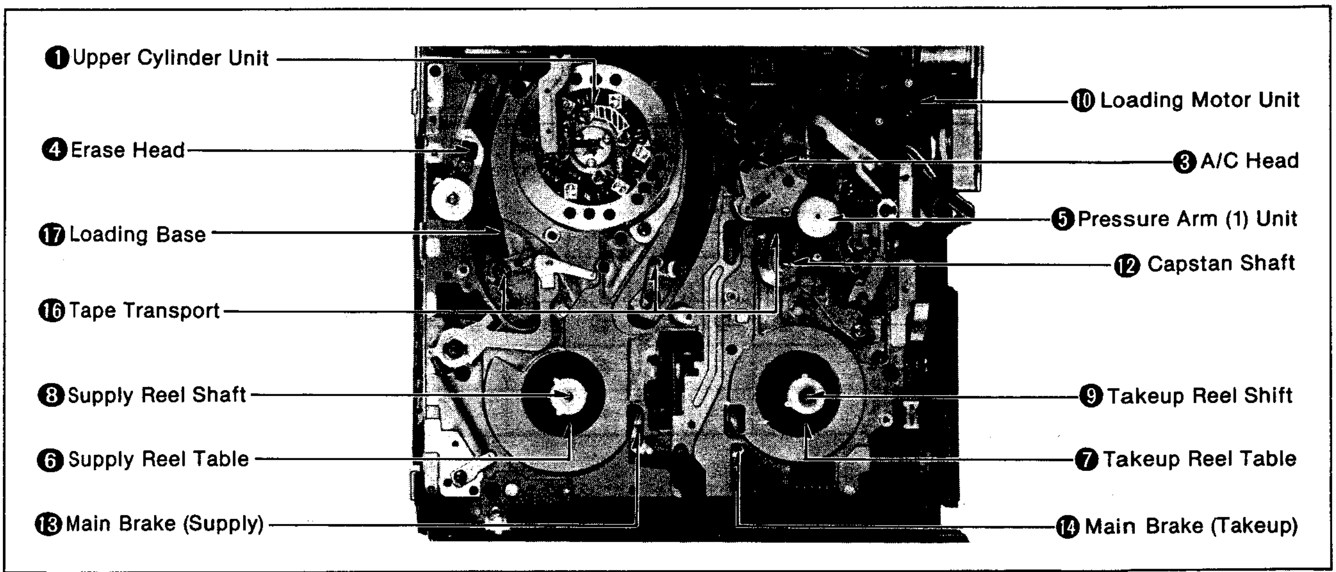
REGULAR MAINTENANCE IS NECESSARY

The VCR is a complicated piece of equipment. It contains many belts, rollers, heads, etc., which become worn, and deteriorate as time goes by, causing trouble. Dust and dirt will also impede the proper functioning of the machine. In light of this, it is very important that overall maintenance be done according to the maintenance chart to maintain the functions of the VCR, and to avoid accidental problems. This maintenance should also be performed after any repairs are done on the equipment.

REGULAR MAINTENANCE IS RECOMMENDED

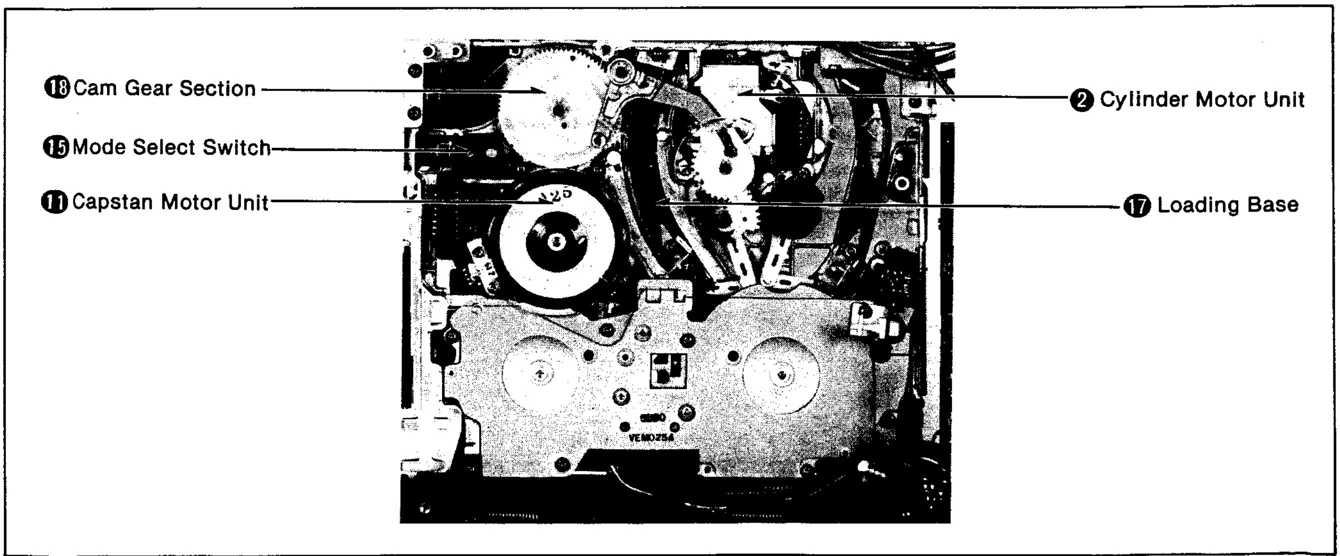
The VCR used for business applications requires particular attention for several reasons. The installation conditions and applications are not always the best. Long use times, or poor environmental conditions may adversely affect the lifespan and performance of the machine. Regular maintenance assures that the purchaser obtains the maximum value for his expenditure. Accordingly, the necessity of regular maintenance should be fully explained at the time of sale, as well as during after-sale repairs.

MAINTENANCE PARTS LOCATION



①Upper Cylinder Unit
④Erase Head
⑰Loading Base
⑯Tape Transport
⑧Supply Reel Shaft
⑥Supply Reel Table
⑬Main Brake (Supply)
⑩Loading Motor Unit
③A/C Head
⑤Pressure Arm (1) Unit
⑫Capstan Shaft
⑨Takeup Reel Shift
⑦Takeup Reel Table
⑭Main Brake (Takeup)

Figure 1 Top View



⑱Cam Gear Section
⑮Mode Select Switch
⑪Capstan Motor Unit
②Cylinder Motor Unit
⑰Loading Base

Figure 2 Bottom View

MAINTENANCE CHART

The following perodic maintenance is required to prolong the life of the machine.
Since the parts are keyed to the Inner Parts Location Diagram, when you replace the following parts, refer to the diagram.

	Parts Name	Unit or Part No.	Hour										
			500	1000	1500	2000	2500	3000	3500	4000	4500	5000	Page
❶	Upper Cylinder Unit	VEH0340	●	◎	●	◎	●	◎	●	◎	●	◎	2-7, 2-8, 2-9
❷	Cylinder Motor Unit	VEG0475	●	●	●	●	●	●	●	●	●	◎	2-7, 2-8, 2-9
❸	A/C Head	VBR0098	●	●	●	●	●	●	●	◎	●	●	2-13, 2-15
❹	Erase Head	VBS0031	●	●	●	●	●	●	●	◎	●	●	———
❺	Pressure Arm (1) Unit	VXL1229	●	●	◎	●	●	◎	●	●	◎	●	———
❻	Supply Reel Table	VXR0122	●	●	●	●	●	●	●	◎	●	●	2-17
❼	Takeup Reel Table	VXR0121	●	●	●	●	●	●	●	◎	●	●	2-17
❽	Supply Reel Shaft	———				▲				▲			2-17
❾	Takeup Reel Shift	———				▲				▲			2-17
❿	Loading Motor Unit	VEM0255				◎				◎			2-19
⓫	Capstan Motor Unit	VEM0206										◎	———
⓬	Capstan Shaft	———	●	●	●	●	●	●	●	●	●	●	———
⓭	Main Brake (Supply) Unit	VXZ0173				◎				◎			2-16
⓮	Main Brake (Takeup) Unit	VXZ0174				◎				◎			2-16
⓯	Mode Select Switch	VSS0099								◎			2-19
⓰	Tape Transport	———	●	●	●	●	●	●	●	●	●	●	2-11, 2-12
⓱	Loading Base	———				■				■			———
⓲	Cam Gear Section	———				■				■			2-18, 2-19, 2-20

*** NOTE:**

Symbol	Maintenance	Requirement	Remark
●	Cleaning	Freon TF, Ethyl-alcohol or Cleaning Liquid (Purchase locally)	Wipe dirt from the parts using soft cloth impregnated with Freon TF or Ethyl-Alcohol. Note: When cleaning rubber parts, avoid using excessive alcohol since it may accelerate deterioration of these parts. After cleaning with alcohol, wipe the alcohol quickly and thoroughly.
◎	Replacement	———	———
▲	Lubrication	High Quality Spindle Oil (Purchase locally)	Supply one or two drops of oil.
■	Greasing	Molytone Grease (MOR265)	Wipe the old Grease and apply new grease.

DISASSEMBLY PROCEDURES

1. DISASSEMBLY FLOWCHART

This flowchart indicates disassembly steps of the cabinet parts and the C.B.A. in order to find the items necessary for servicing.
When reassembling,perform the steps in the reverse order.
The bottom case can be removed individually.

* Note: When removing the cabinet, work with care so as not to break the locking portions.

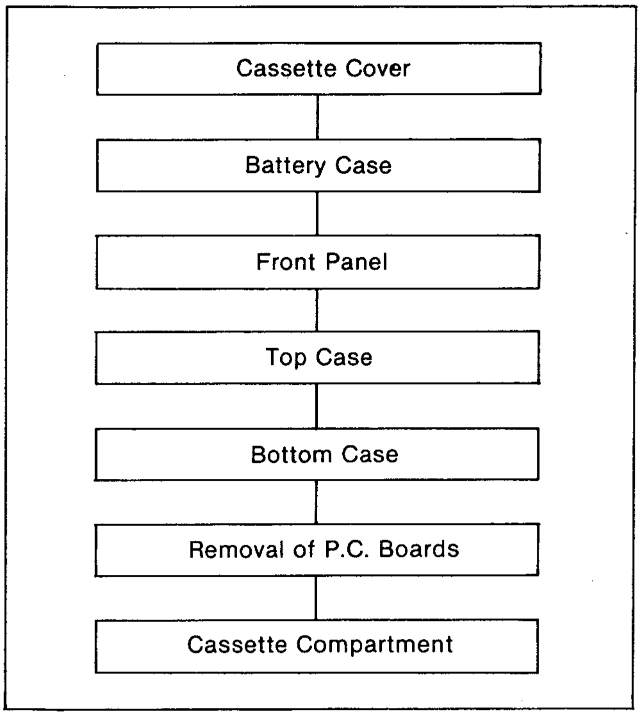


Figure D1 Disassembly Flowchart

2. DETAILED DISASSEMBLY METHOD

* Notes:

1. Place a cloth or any other soft material under the C.B.A. or deck for preventing them being damaged while servicing.
2. When reassembling, ensure the connectors are connected and any electrical components are not damaged.
3. Do not supply power to the deck during disassembly except for removal of the cassette cover.

2-1. REMOVAL OF THE CASSETTE COVER

Supply power the deck and turn it on.
Then press the EJECT button to raise the cassette up holder.
Remove 2 rubber covers and 2 screws (A). Then carefully lift and pivot the front portion to remove.
Pay attention so as not to damage the locking portions (B).

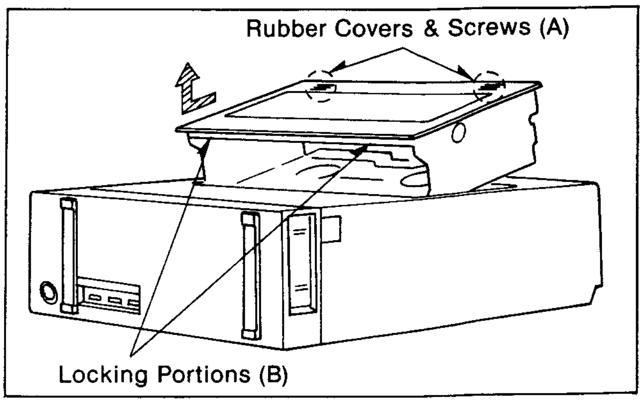


Figure D2 Removal of the Cassette Cover

* Note: When reinstalling, first lock the locking portions (B).

2-2. REMOVAL OF BATTERY CASE

(1) First confirm that the battery is not inside the battery compartment.
If it is, remove the battery.
(2) Place the deck upside down so the bottom case faces upward.
(3) Remove 2 screws (C), and hold both right and left ends of the battery case. Then carefully lift and pivot the top portion of the battery case.
(4) Disconnect the Battery connector and picture connector from the main C.B.A.

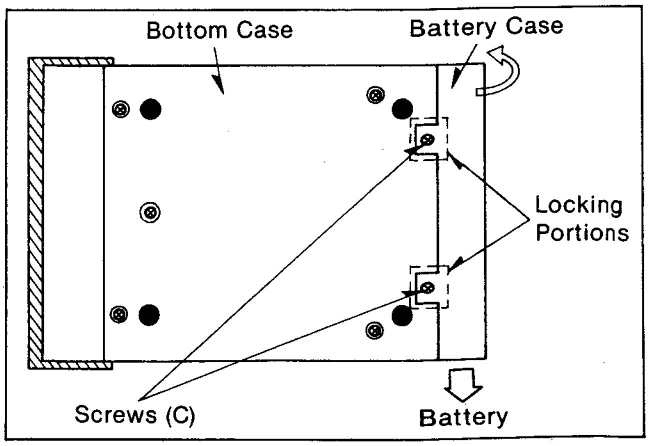


Figure D3 Removal of the Battery

2-3. REMOVAL OF THE FRONT PANEL

1. Place the deck upside down so that bottom case faces upward.
2. Remove the 4 audio level control knobs on the front panel.
3. Remove 2 screws (E), and hold both right and left side of the front panel. Then carefully lift and pivot the bottom portion of the front panel as shown in Figure D4.

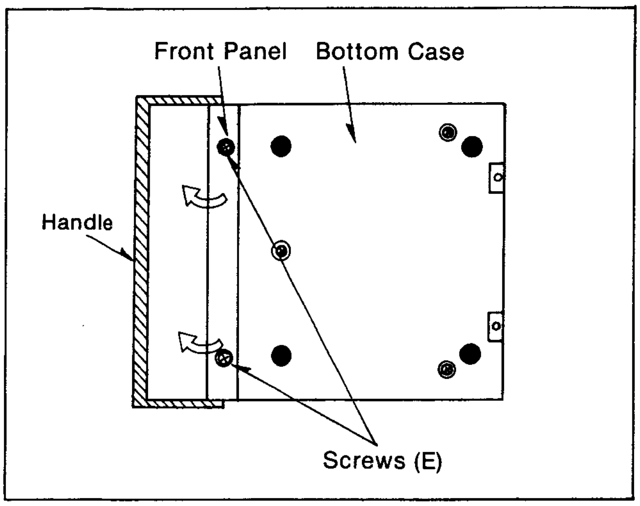

Front Panel
Bottom Case
Handle
Screws (E)

Figure D4 Removal of the Front Panel

4. Disconnect the remote controller connector P6503 from the front C.B.A.

2–4. REMOVAL OF THE TOP CASE

1. Remove the 2 screws (F) on the rear part of the top case. Then remove the top case by lifting the rear portion and pay attention. (Figure D5)

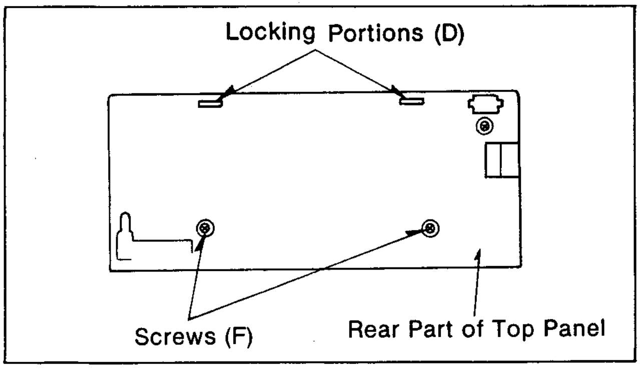

Locking Portions (D)
Screws (F)
Rear Part of Top Panel

Figure D5 Removeal of the Top Case

2–5. REMOVAL OF THE BOTTOM CASE

1. Place the deck upside down so the bottom case upward.
2. Remove 3 screw (G). Then remove the bottom case.
3. Unsolder the GND wire from shield case on the bottom case. (Figure D6)

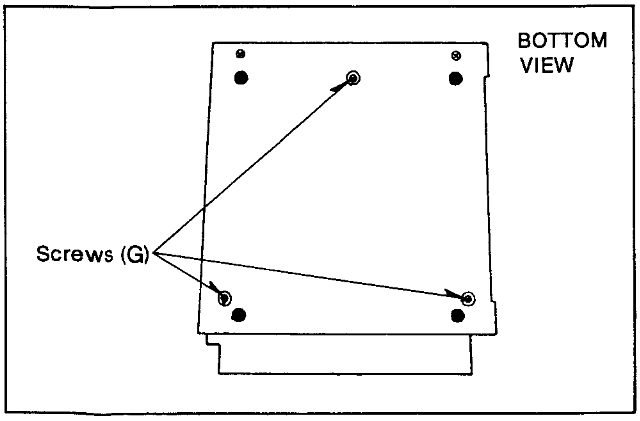

BOTTOM VIEW
Screws (G)

Figure D6 Removal of the Bottom Case

2–6. REMOVAL OF THE FRONT C.B.A. AND MAIN C.B.A.

1. Remove 2 screws (D) and unlock 3 points of P.C.B. locking tab (H). Then carefully pivot the top portion of the C.B.A.

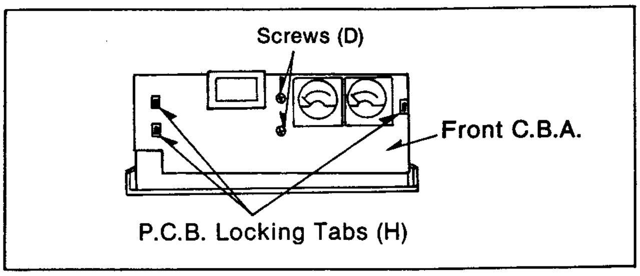

Screws (D)
Front C.B.A.
P.C.B. Locking Tabs (H)

Figure D7 Removal of the Front C.B.A.

2. Remove 2 screws (I) on the video pack C.B.A.

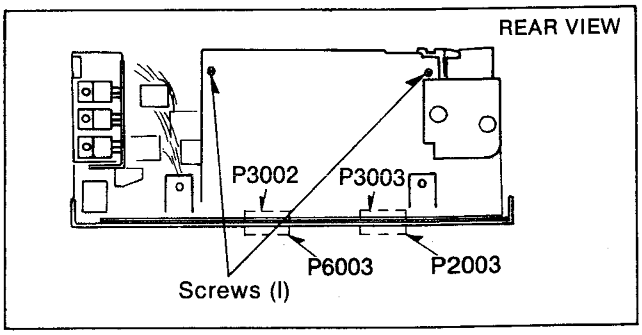

REAR VIEW
P3002
P3003
P6003
P2003
Screws (I)

Figure D8

3. Remove 4 screws (J) on the Main C.B.A.

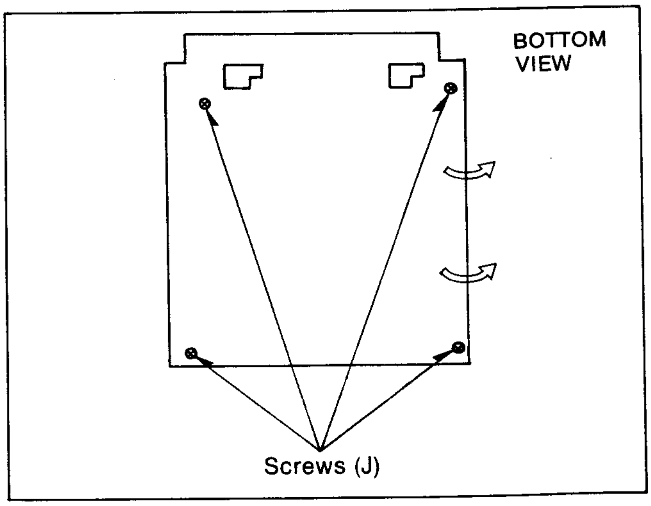

BOTTOM VIEW
Screws (J)

Figure D9

4. Disconnect connector P6601 on the main C.B.A. and earth cable then carefully lift the C.B.A.s to remove as shown in Figure D10.

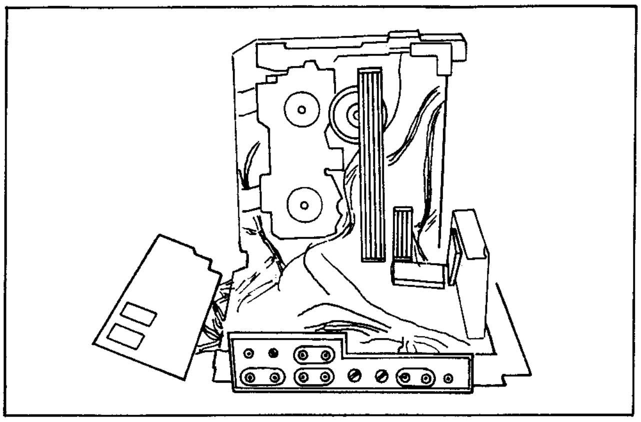


Figure D10 Removal of the Front C.B.A. and Main C.B.A.

2–7. REMOVAL OF THE POWER/FRAMING/REEL SERVO C.B.A.

1. Remove the 5 screws (K), Then carefully lift the C.B.A.

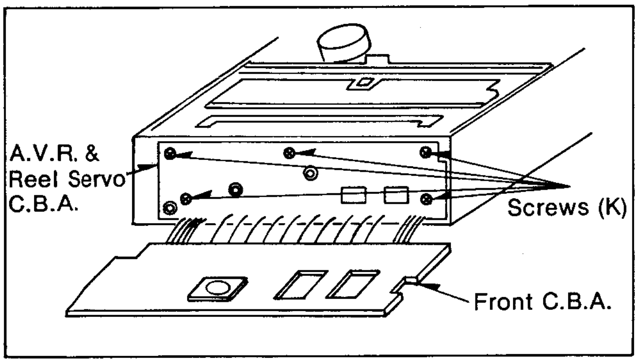

A.V.R. &
Reel Servo
C.B.A.
Screws (K)
Front C.B.A.

Figure D11 Removal of the A.V.R./Reel Servo C.B.A.

2–8. REMOVAL OF THE CASSETTE COMPARTMENT

* Note: This adjustment should be perform after the removal of the main C.B.A.

1. Remove 2 screws (L) and remove 5 screws (M) on the chassis.
2. Eject the cassette compartment.
3. Remove the supply photo TR unit, removing the screw (N).
4. Remove the takeup photo TR unit, removing the screw (P).
5. Remove connector P654 from Audio Erase Head C.B.

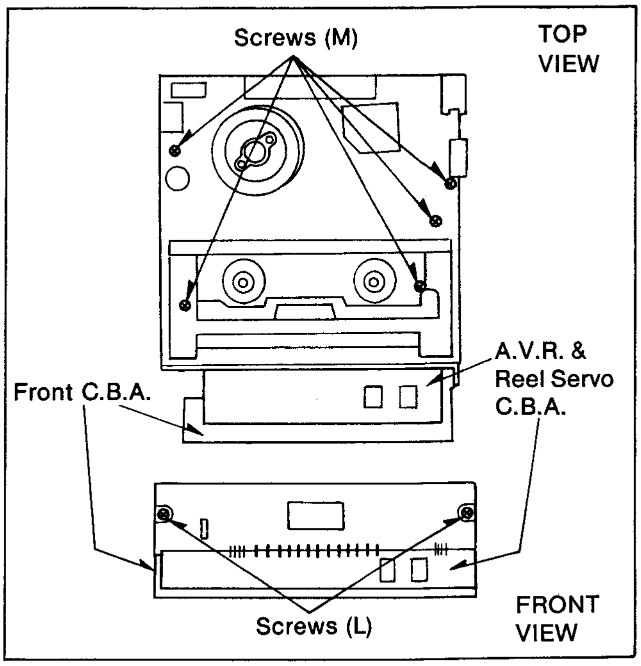

Screws (M)
TOP VIEW
Front C.B.A.
A.V.R. &
Reel Servo
C.B.A.
Screws (L)
FRONT VIEW

Figure D12 Removal of the Cassette Compartment–(1)

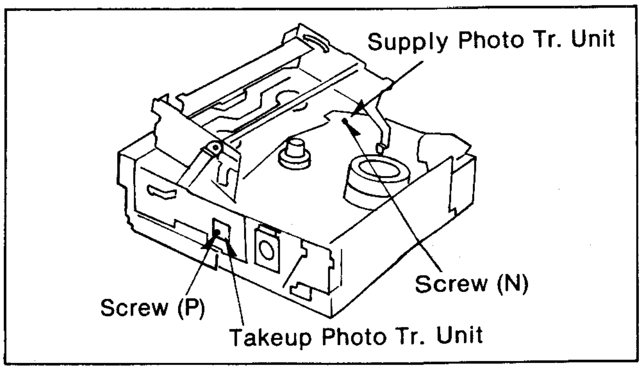

Supply Photo Tr. Unit
Screw (N)
Screw (P)
Takeup Photo Tr. Unit

Figure D13 Removal of the Cassette Compartment–(2)

* Note: When reinstalling, first insert the back portion of the cassette compartment.

6. If you want to eject the cassette compartment having a cassette tape without the electrical power, push (Q) portion of the cassette lock lever, inside of Mechanical Chassis with small screwdriver.

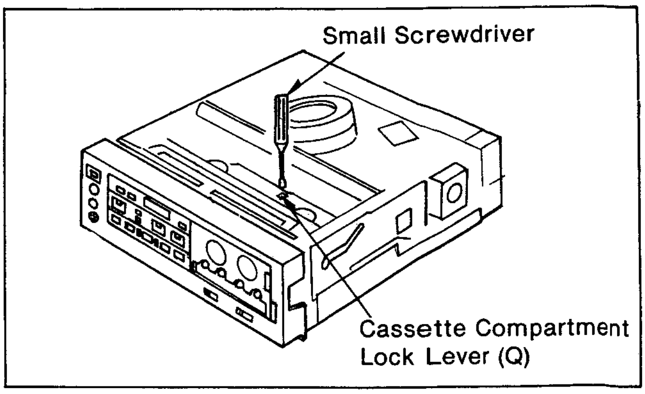

Small Screwdriver
Cassette Compartment
Lock Lever (Q)

Figure D14 Removal of the Cassette Compartment (3)

MECHANICAL ADJUSTMENT PROCEDURES

this section provides complete mechanical adjustment procedues which may be required for mechanical section.

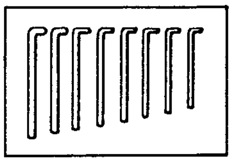
1. SERVICING FIXTURES & TOOLS

VFM8180HMDH VHS Alignment Tape

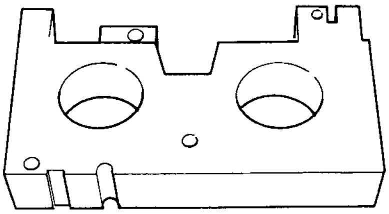
•	(1)	•	(2)	•	(3)	•	(4)

No.	VIDEO	FM AUDIO	NORMAL AUDIO
(1)	MONOSCOPE	—	3kHz (MONO)
(2)	MONOSCOPE	1kHz	6kHz (MONO)
(3)	—	—	400, 1k, 5k, 8kHz (MONO)
(4)	—	—	3kHz (2CH)
• TRANSLUCENT TAPE (150mm)			

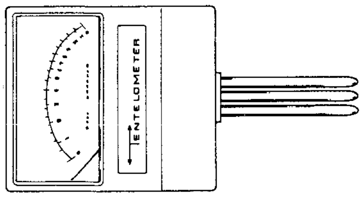
VFK0326 Hex. Wrench (Set)
(0.7, 0.9, 1.2, 1.5, 1.6, 2, 2.4, 3mm)



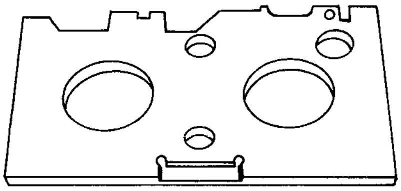
VFK0188 Cassette Holder Fixture



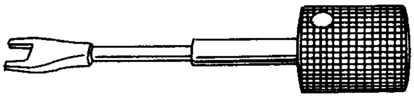
VFK0132 Back Tension Meter (TZ-H7-UM) (Tentelometer)



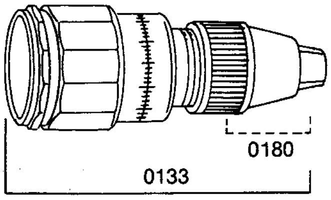
VFK0191 Post Adjustment Plate



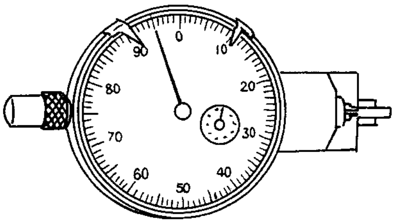
VFK0328 H-Position Adj. Fixture



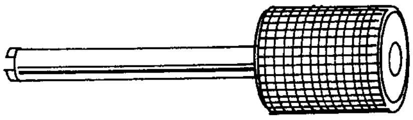
VFK0133 (Dial Torque Gauge)
VFK0180 (Plastic Clamper Only)



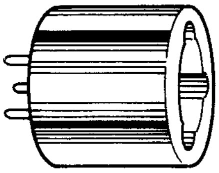
VFK0190 Reel Table Height Fixture



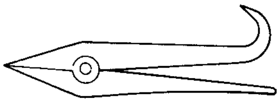
VFK0329 Post Adjustment Screwdriver



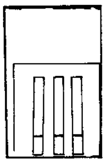
VFK0134 Adaptor for VFK0133



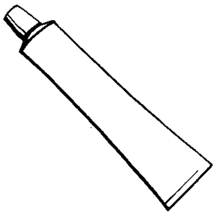
VFK0335 Retaining Ring Remover (3mm/4mm)



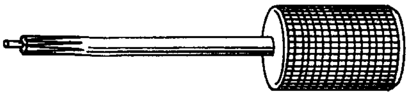
VFK27 Head Cleaning Stick



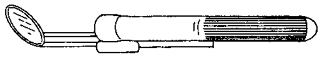
MOR265 Morlytone Grease



VFK0330 Fine Adjustment Screwdriver (3mmϕ)



VFK0343 Check Light



Height Quality Machine Oil
<Purchase Locally>
(Reel Shaft. Capstan Shaft etc.)

Cleaning Liquid
(Freon TF., Alchol)
<Purchase Locally>
(Tape Transport Rubber Parts etc.)

2. CYLINDER MAINTENANCE PROCEDURES

2-1. REMOVING THE UPPER CYLINDER UNIT

* Note: Do not touch video heads during servicing.

1. Remove the screw (A) and the Grounding Spring (Figure M1).

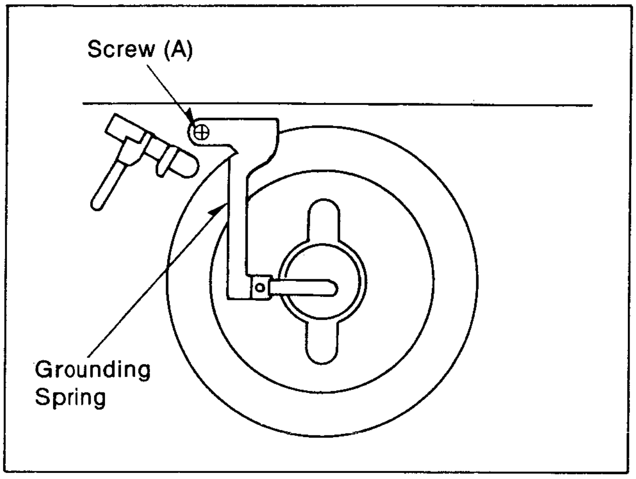

Screw (A)
Grounding Spring

Figure M1 Removing the DD Cylinder Unit

2. First remove two screws as shown in Figure M2. Then unsolder 12 (Figure M2) of the soldered portions indicated by arrows on the Upper Cylinder, and finally remove the Upper Cylinder.

* Note: Soldered portion can be easily removed by using solder sucking wire, etc.

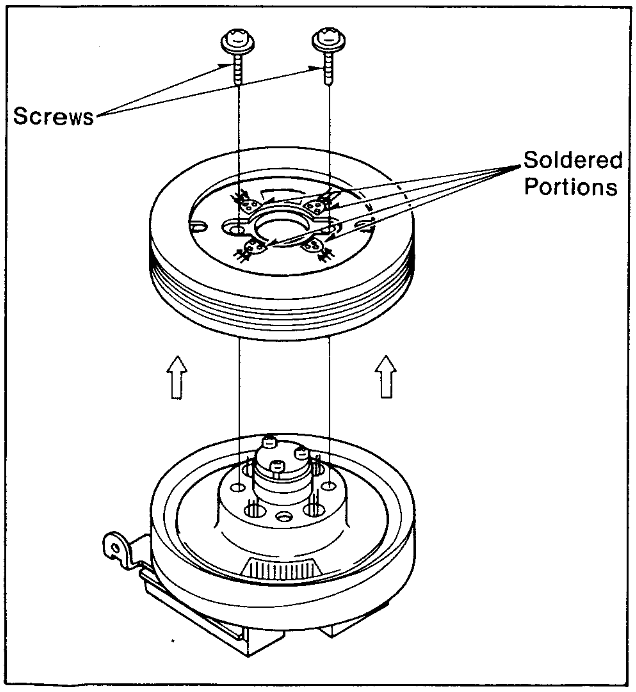

Screws
Soldered Portions

Figure M2 Removing the Upper Cylinder Unit

* CAUTION: Do not loosen the 3 small screws on the top of the cylinder as shown in Figure M3. If these 3 small screws are losened, cylinder motor is broken and it can not repaired.

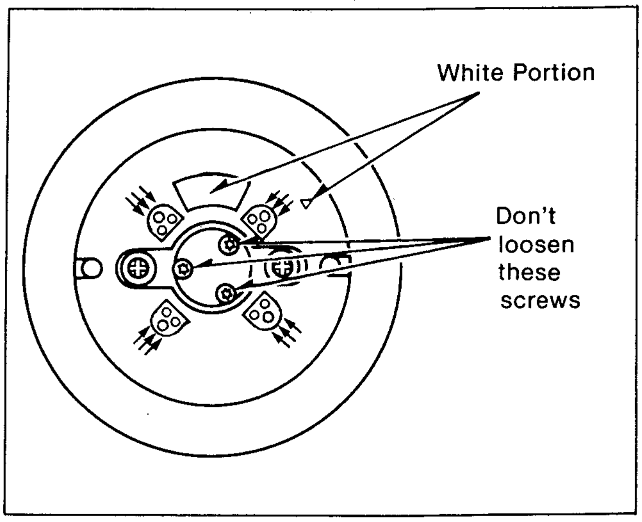

White Portion
Don't loosen these screws

Figure M3 Solder Points of Upper Cylinder

2-2. REINSTALLING THE UPPER CYLINDER

The Upper Cylinder unit can be reinstalled by reversing the removal procedure.
However, when upper cylinder is installed, be extremelycarefully so that white portion of P.C. board of upper cylinder correctly matches the white portion of bottom cylinder as shown in Figure M4.

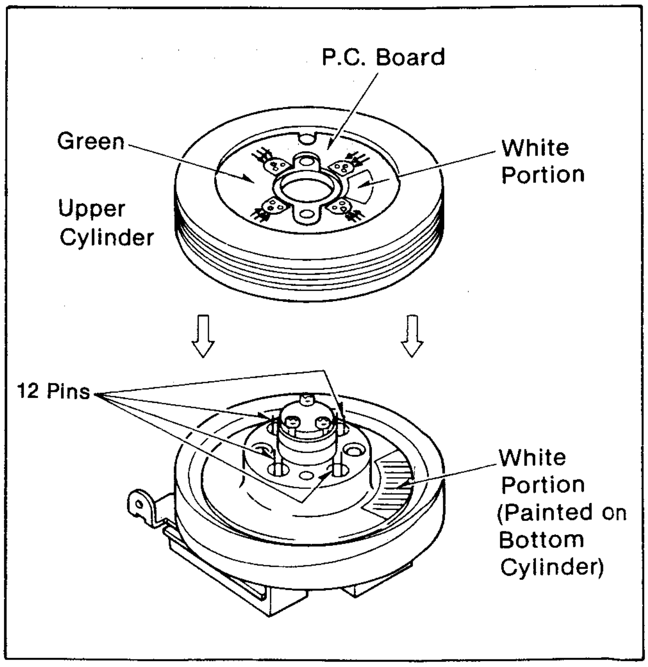

P.C. Board
Green
White Portion
Upper Cylinder
12 Pins
White Portion (Painted on Bottom Cylinder)

Figure M4 Reinstalling the Upper Cylinder

* Note: If the Upper Cylinder Unit is reversely installed, no colour will appear when playing back pre-recorded tapes.

2-3. PROCEDURES FOR CLEANIONG OF CYLINDER UNIT

1. Position the video head to permit access for cleaning and hold the upper cylinder to keep it from turning while cleaning.
2. Gently rub the video head in direction of tape travel with Head Cleaning Stick moistened with Freon TF.
3. Repeat for the other video heads. (Figure M5).

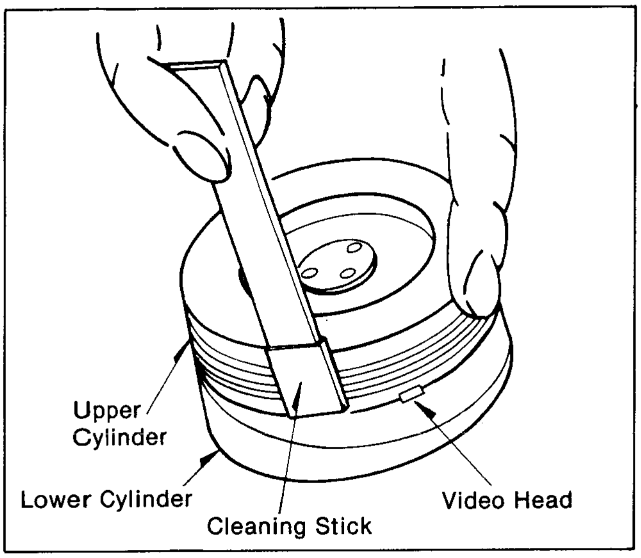


Figure M5 Head Cleaning

* Notes:
1. Do not rub vertically.
2. Do not apply any pressure to head. If contaminant is not easily removed, continued gentle wiping will usually remove the substance.
3. Do not rotate the Upper Cylinder Unit clockwise when cleaning it.

2-4. REPLACEMENT OF DD CYLINDER UNIT

* Note: Work with extreme care when removing or replacing the DD cylinder unit. Do not touch video heads during servicing.

1. Remove the screw (A) and the Grounding Spring. (Figure M6)

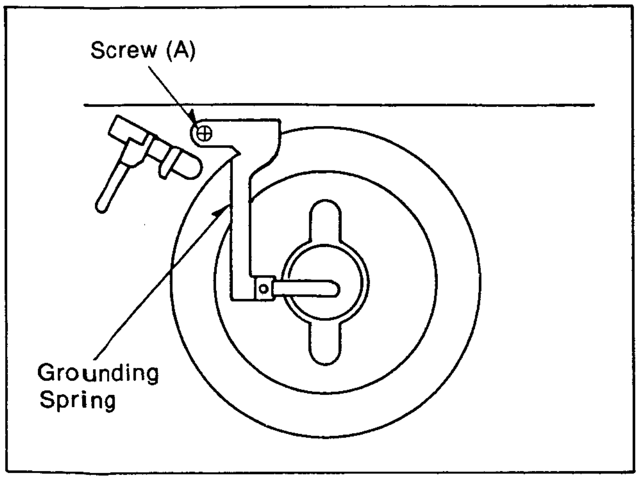


Figure M6 Replacement of DD Cylinder Unit (1)

2. Disconnect 2 connectors under the cylinder section.
3. Remove the 3 screws and DD cylinder unit. (Figure M7)

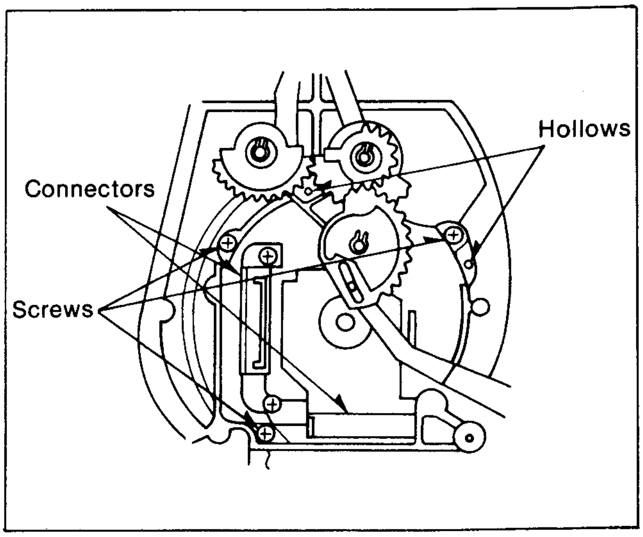


Figure M7 Replacement of DD Cylinder Unit (2)

* Note: Since there is very little clearance between DD cylinder unit and chassis, remove the DD cylinder unit gently and carefully.

4. Reinstall the new cylinder unit, tighten the 3 screws. Then connect 2 connectors.

* Notes: Reinstall the new DD cylinder unit, so that the projections (A) on the chassis agree with the hollows (B) under the cylinder. (Figure M8)

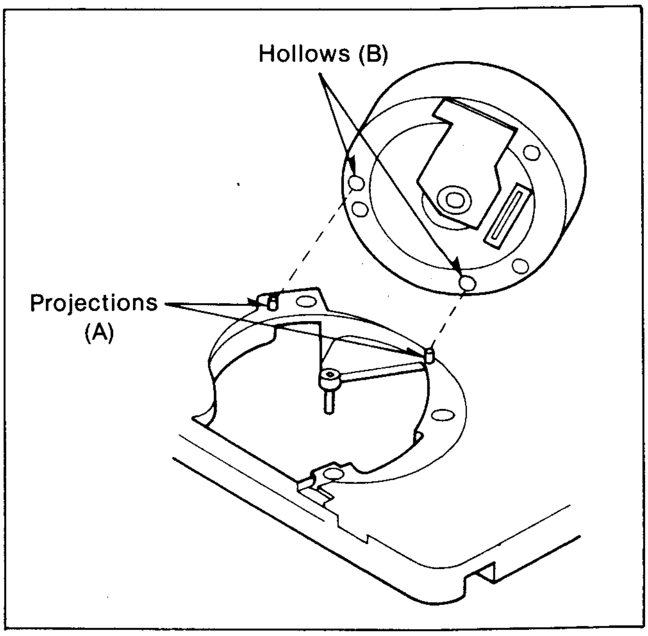


Figure M8 Replacement of DD Cylinder Unit (3)

* Notes:

1. Gently rub the video head in direction of tape travel with Head Cleaning Stick moistened with Freon TF.
2. After replacement, confirm performance. If any further maintenance is required, perform "TAPE INTERCHANGEABILITY ADJUSTMENT".
3. After replacing the new DD cylinder unit, check to see if the Grounding Spring is correctly set in a position within 2mm to the right from the center of the cylinder shaft as shown in Figure M9.
4. Never install the Grounding Spring to any position to left from the center of the cylinder shaft, but always within a maximum of 2mm to the right of the center of this shaft.

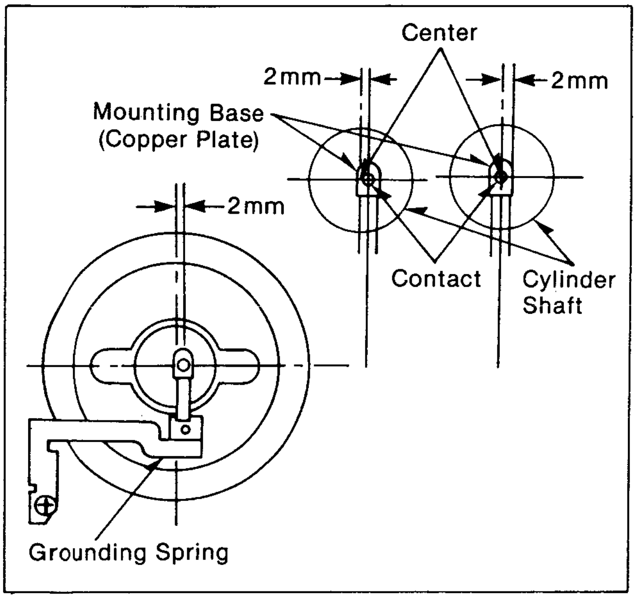

Center
2mm
2mm
Mounting Base
(Copper Plate)
2mm
Contact
Cylinder
Shaft
Grounding Spring

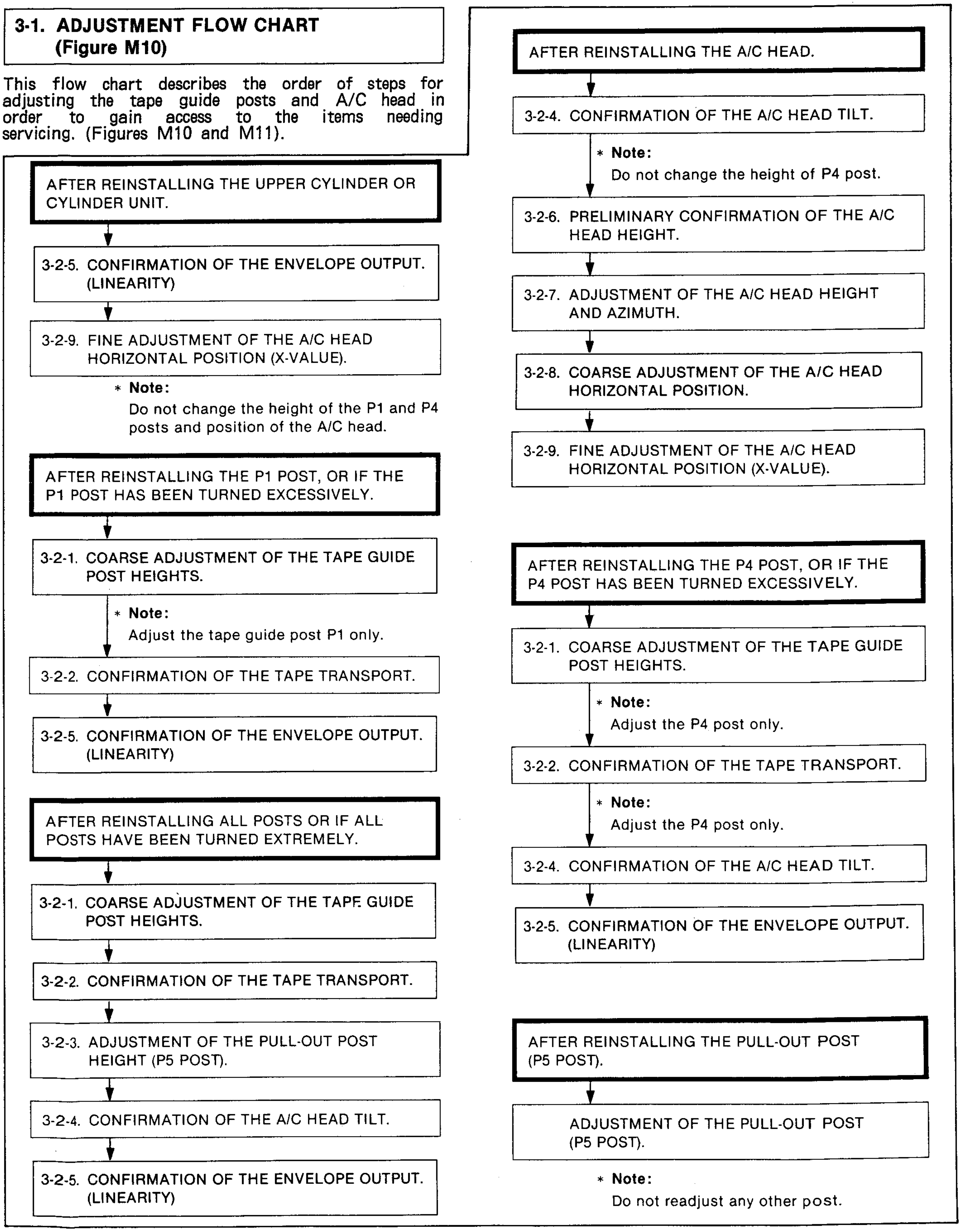
Figure M9 Confirmation of GND Spring Installation Position

5. Do not scratch the Mounting Base with screws on the DD cylinder unit.

3. TAPE INTERCHANGEABILITY ADJUSTMENT PROCEDURES

3-1. ADJUSTMENT FLOW CHART (Figure M10)

This flow chart describes the order of steps for adjusting the tape guide posts and A/C head in order to gain access to the items needing servicing. (Figures M10 and M11).



AFTER REINSTALLING THE UPPER CYLINDER OR CYLINDER UNIT.
3-2-5. CONFIRMATION OF THE ENVELOPE OUTPUT. (LINEARITY)
3-2-9. FINE ADJUSTMENT OF THE A/C HEAD HORIZONTAL POSITION (X-VALUE).
* Note: Do not change the height of the P1 and P4 posts and position of the A/C head.
AFTER REINSTALLING THE P1 POST, OR IF THE P1 POST HAS BEEN TURNED EXCESSIVELY.
3-2-1. COARSE ADJUSTMENT OF THE TAPE GUIDE POST HEIGHTS.
* Note: Adjust the tape guide post P1 only.
3-2-2. CONFIRMATION OF THE TAPE TRANSPORT.
3-2-5. CONFIRMATION OF THE ENVELOPE OUTPUT. (LINEARITY)
AFTER REINSTALLING ALL POSTS OR IF ALL POSTS HAVE BEEN TURNED EXTREMELY.
3-2-1. COARSE ADJUSTMENT OF THE TAPE GUIDE POST HEIGHTS.
3-2-2. CONFIRMATION OF THE TAPE TRANSPORT.
3-2-3. ADJUSTMENT OF THE PULL-OUT POST HEIGHT (P5 POST).
3-2-4. CONFIRMATION OF THE A/C HEAD TILT.
3-2-5. CONFIRMATION OF THE ENVELOPE OUTPUT. (LINEARITY)
AFTER REINSTALLING THE A/C HEAD.
3-2-4. CONFIRMATION OF THE A/C HEAD TILT.
* Note: Do not change the height of P4 post.
3-2-6. PRELIMINARY CONFIRMATION OF THE A/C HEAD HEIGHT.
3-2-7. ADJUSTMENT OF THE A/C HEAD HEIGHT AND AZIMUTH.
3-2-8. COARSE ADJUSTMENT OF THE A/C HEAD HORIZONTAL POSITION.
3-2-9. FINE ADJUSTMENT OF THE A/C HEAD HORIZONTAL POSITION (X-VALUE).
AFTER REINSTALLING THE P4 POST, OR IF THE P4 POST HAS BEEN TURNED EXCESSIVELY.
3-2-1. COARSE ADJUSTMENT OF THE TAPE GUIDE POST HEIGHTS.
* Note: Adjust the P4 post only.
3-2-2. CONFIRMATION OF THE TAPE TRANSPORT.
* Note: Adjust the P4 post only.
3-2-4. CONFIRMATION OF THE A/C HEAD TILT.
3-2-5. CONFIRMATION OF THE ENVELOPE OUTPUT. (LINEARITY)
AFTER REINSTALLING THE PULL-OUT POST (P5 POST).
ADJUSTMENT OF THE PULL-OUT POST (P5 POST).
* Note: Do not readjust any other post.

Figure M10

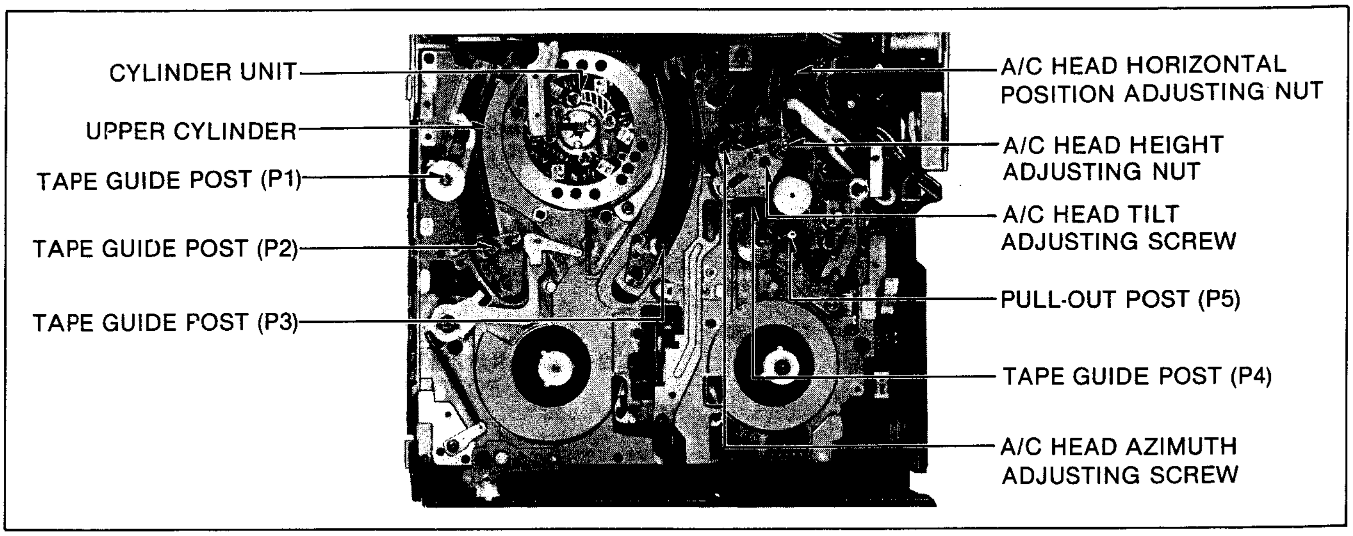

CYLINDER UNIT
UPPER CYLINDER
TAPE GUIDE POST (P1)
TAPE GUIDE POST (P2)
TAPE GUIDE POST (P3)
A/C HEAD HORIZONTAL POSITION ADJUSTING NUT
A/C HEAD HEIGHT ADJUSTING NUT
A/C HEAD TILT ADJUSTING SCREW
PULL-OUT POST (P5)
TAPE GUIDE POST (P4)
A/C HEAD AZIMUTH ADJUSTING SCREW

Figure M11

3-2. ADJUSTMENT PROCEDURES

3–2–1. COARSE ADJUSTMENT OF THE TAPE GUIDE POST HEIGHTS (P1,P2,P3 AND P4)

* Notes: The tape guide post P1,P2 and pull–out post have been precisely adjusted at the factory. Therefore, normally do not change the height. The following adjustment is required only when replacing the posts.

* Equipment Required:
Post Adjustment Plate................VFK0191
Reel Table Height Fixture............VFK0190
Nut Driver (Purchase locally)
Post Adjustment Screwdriver..........VFK0329

1. Remove the Top Panel and the Top Loading Unit.
2. Place the Post Adjustment Plate over the reel tables. (Figure M12). Confirm that the Post Adjustment Plate is firmly seated.

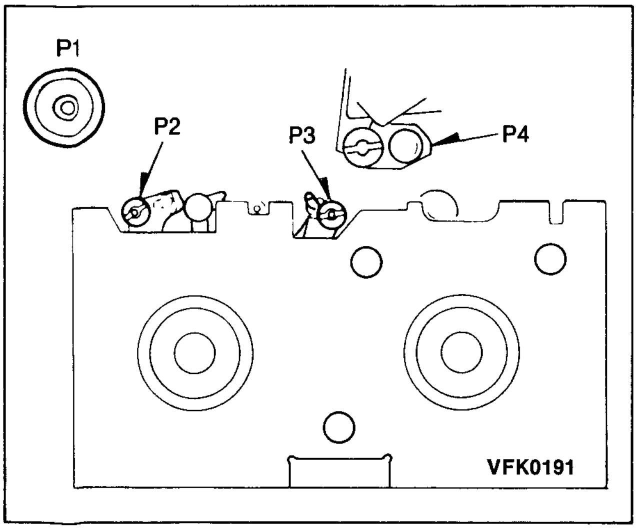

P1
P2
P3
P4
VFK0191

Figure M12

3. Lower the tape guide posts so that the lower tape guide on each post is below the top surface of the adjustment plate.
   Use the Post Adjustment screwdriver to lower posts P2 and P3, and the Nut Driver to lower posts P1 and P4.
4. Place the Reel Table Height Fixture on the Post Adjustment Plate and lower the scraper so that it touches the plate.

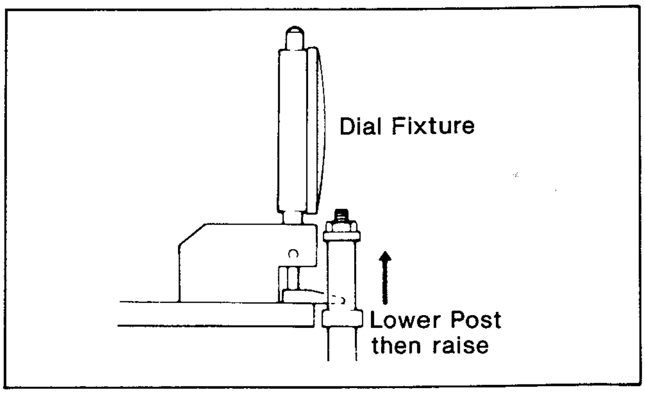

Dial Fixture
Lower Post then raise

Figure M13

5. Place the side of the scraper aginst the each post as shown in Figure M13, set the fixture to zero, then slowly raise the post until the lower tape guide just touches the bottom of the scraper. Use the fixture to determine the exact point at which the lower tape guide touches the scraper. (Figure M14)

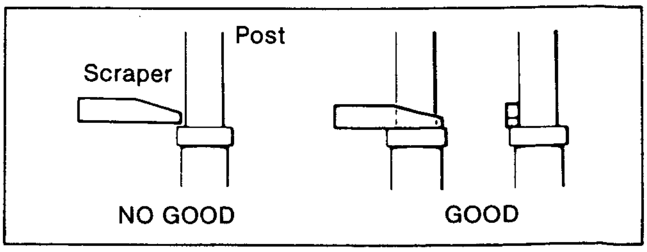

Post
Scraper
NO GOOD
GOOD

Figure M14

3-2-2. CONFIRMATION OF THE TAPE TRANSPORT (TAPE GUIDE POSTS)

* Notes:

1. The tape guide posts have been precisely adjusted at the factory. Therefore, normally do not change the height of P1 and P4 posts. The following adjustment is required only when replacing the posts.
2. If curling is apparent proceed to the P4 post, wipe dirt from the pressure roller and capstan shaft using a soft cloth impregnated with Freon TF or cleaning liquid.
3. The adjustment of the post height is required only the one which has been replaced.

* Equipment Required:
Post Adjustment Screwdriver..........VFK0329
Nut Driver (Purchase locally)

1. To prevent the alignment tape from being damaged, use a normal cassette tape for this procedure.
Playback the normal cassette tape and confirm that the tape travels without any curling at the edges of all the posts. (Figures M15,M16 and M17)

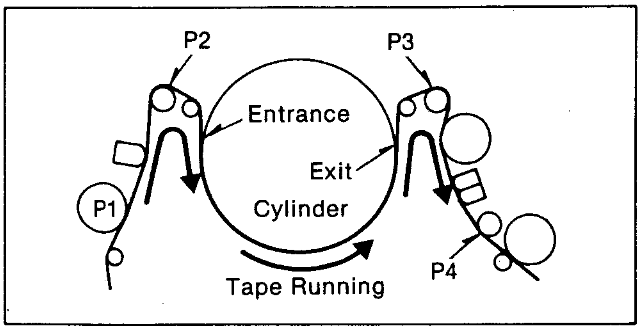


Figure M15 Tape Transport Posts

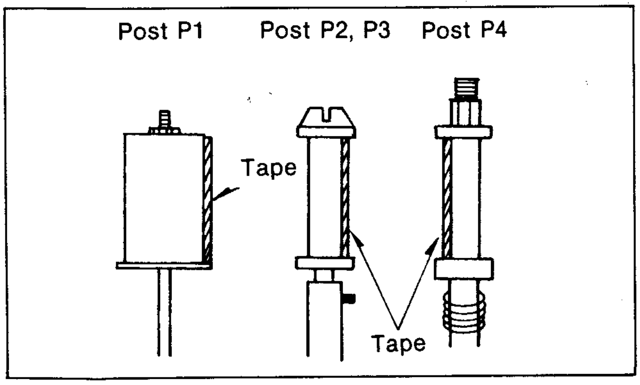


Figure M16 P1,P2,P3,P4 Posts

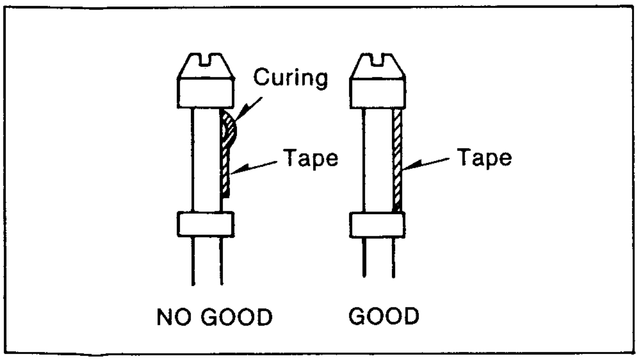


Figure M17 P1,P2 Posts

2. If curling is apparent, adjust the height of posts by turning the top of post with the post adjustment screwdriver (Posts P2 and P3) or the nut driver (Posts P1 and P4). (Figures M16 and M17)
3. After adjusting the P4 post, adjustment of the pull-out post (P5) is required.
(Refer to "ADJUSTMENT OF THE PULL-OUT POST HEIGHT".)
4. If the tape curling cannot be acomplished by adjusting the tape guide posts, then adjustment of the A/C head tilt may be needed.

3-2-3. ADJUSTMENT OF THE PULL-OUT POST (P5 POST) HEIGHT

* Notes:

1. This adjustment should be performed only after adjusting tape guide post P4 as the height of the pull-out post is based on the height of post P4.
2. This adjustment should be performed with the unit in the loading-completion mode.
3. Before this adjustment, simulate the cassette down condition without cassette tape.

1.Remove the cassette compartment, and cover the take up and supply photo transistors with black tape.
Press the Lock Lever (B) until the cassette down condition as shown Figure M18.

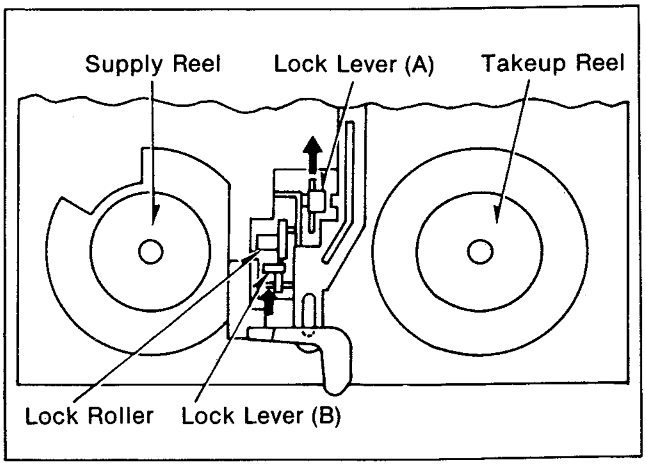


Figure M18 Cassette Down Condition Without Cassette Tape

2.After this adjustment is finished, return the Lock Lever (B) to Eject position as described below.
3.How to return Eject position.
Pull up the Lock Roller, while Pressing the Lock Lever (A) as direction indicated by the arrow shown in Figure M18.

* Tools and Equipment Required:
Post Adjustment Plate...............VFK0191
Reel Table Height Fixture...........VFK0190
Nut Driver (Purchase locally)

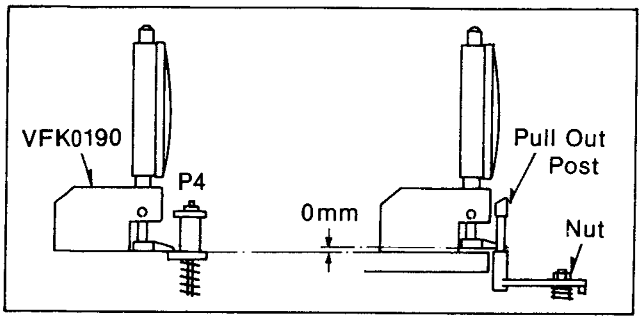


Figure M19 P5 Post

1. Turn the power switch on.
2. Insert a cassette tape to the cassette Compartment, then press the play button. This simulates the loading completion mode.
3. Unplug the unit from the power source.
4. Place the Post Adjustment plate over the reel tables.
5. Place the Reel Table Height Fixture on the tape guide post P4,lower the scraper so that it touches the lower edges of P4, then set the gauge to zero ("0"). (Figure M19)
6. Slightly lower the pull–out post by turning the nut on the post clockwise with the nut driver, and set the side of the scraper against the post as shown in Figure M14.
7. Slowly turn the nut on the post counterclockwise until the fixture reads 0mm. (Figure M19)
8. Confirm there is no tape curling at P4 post during reverse mode.
   If tape curling occurs, back to step 5.

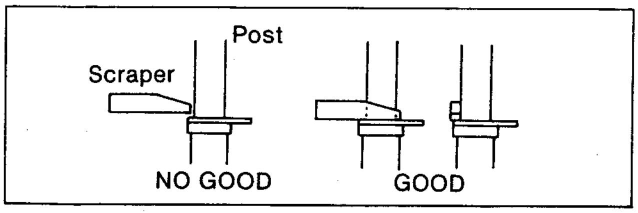


Figure M20 Post Adjustment

3–2–4. CONFIRMATION OF THE A/C HEAD TILT

* Note: This procedure should be performed after replacing the A/C head and pressure roller, and adjusting the height of the tape guide post (P4).

* Tools and Equipment Required:
Screw Driver (purchase locally)

1. Playback the begnning portion of NV–E240 cassette tape and confirm that the tape runs between lower and upper limiters of the P4 post. If there is waving or frilling in the lower edge or top edge of the tape, correct the tilt of the A/C head by turning the screw(C) located behind the A/C head. (Figure M21)

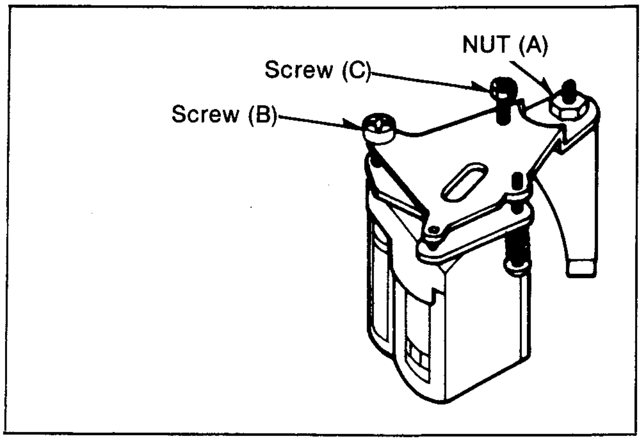


Figure M21 A/C Head Tilt

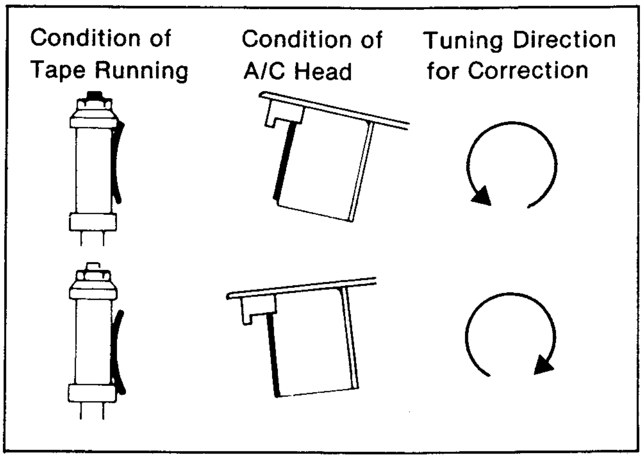


Figure M22 Confirmation of Tilt of A/C Head

2. If correction of the tape curling cannot be acomplished by adjusting the A/C head tilt, then readjustment of the height of the tape guide post (P4) may be needed.

* Notes:
1. The tape guide post (P4) has been precisely adjusted at the factory. Therefore, normally the tape guide post (P4) readjustment is not required to eliminate the tape curling.
2. After adjusting the A/C head tilt, the A/C head height adjustment is required.

3–2–5. CONFIRMATION OF THE ENVELOPE OUTPUT (LINEARITY)

* Note: Before playing back the alignment tape, playback a normal cassette tape and confirm correct transport(Refer to "CONFIRMATION OF THE TAPE TRANSPORT").

* Tools and Equipment Required:
Hex Wrench Set......................VFK0326
Post Adjustment Screwdriver..........VFK0329
Alignment Tape..................VFM8180HMDH

1. Connect the scope to TP3007 on the VIDEO section and TP3006 on the same C.B.A. to Ext–Trigger the scope.
2. Playback the 2nd portion (Monoscope) of the alignment tape VFM8180HMDH.

3. Turn the Tracking Control VR and adjust for maximum VIDEO FM envelope.
4. If the VIDEO FM envelope appears like example "A" or "B" in Figure M23, then adjustment of the tape guide post (P2: Entrance) is necessary.
5. Adjust the tape guide post (P2) with the post adjustment screwdriver so that the VIDEO FM envelope waveform at the entrance portion becomes flat as shown "C" in Figure M23.

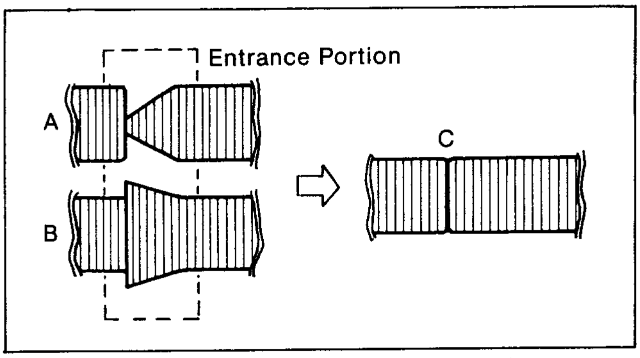


Figure M23 VIDEO FM Envelope(1)

6. If the VIDEO FM envelope appears like example "D" or "E" in Figure M24, then adjustment of the tape guide post (P3: Exit) is necessary.
7. Adjust the tape guide post (P3) in the same manner as the P2 post so that the exit portion becomes flat as shown in "F" in Figure M24.

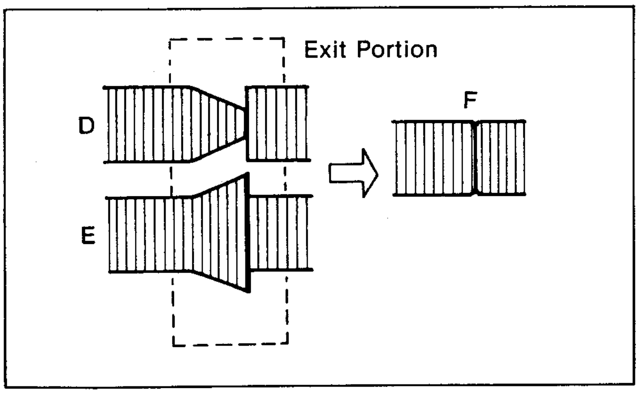


Figure M24 VIDEO FM Envelope(2)

8. Turn the Tracking VR from end to end.
   The variation of VIDEO FM envelope should be nealy parallel as shown in Figure M25.
9. Turn the Tracking VR and adjust for maximum VIDEO FM envelope.
   If the VIDEO FM envelope does not meet these specs,
   V1/V = more than 0.7
   V2/V = more than 0.8
   then repeat stsps 1–8 again. (Figure M27)

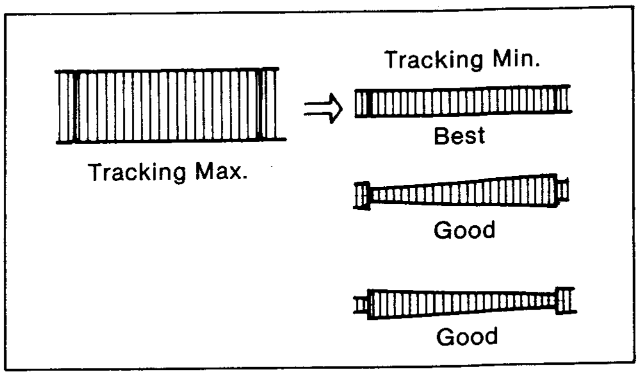


Figure M25 FM Envelope (3)

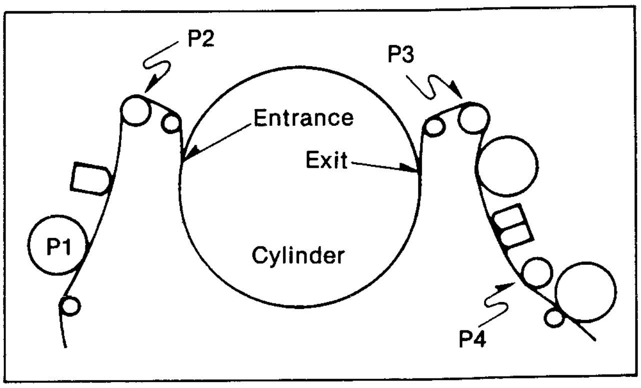


Figure M26 Loading Posts

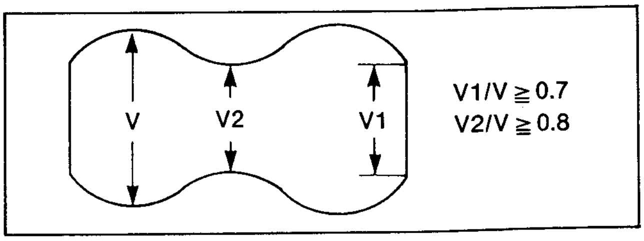


Figure M27 Spec.of Envelope

10. Turn the Tracking VR from end to end again and then back to the detent (Fix) position.
    At the detent position, the VIDEO FM envelope waveform should be at maximum. If it is not at maximum then "ADJUSTMENT OF THE A/C HEAD HORIZONTAL POSITION" is necessary.
    (Refer to "FINE ADJUSTMENT OF THE A/C HEAD HORIZONTAL POSITION".)

3-2-6. PRELIMINARY CONFIRMATION OF THE A/C HEAD HEIGHT

* Note: This procedure should be performed only when the A/C Head is replaced.

* Tools and Equipment Required:
Nut Driver (Purchase locally)

With the tape running, look at the lower edge of the control head and check if the lower edge of tape runs along the lower edge of the control head.
If it doesn't, slightly turn the nut (A) behind the A/C Head (Figure M21) to either lower or raise the A/C head so that the tape runs along the lower edge of the control Head. Turn the nut (A) clockwise to lower the head, and counterclockwise to raise it. (Figure M28).

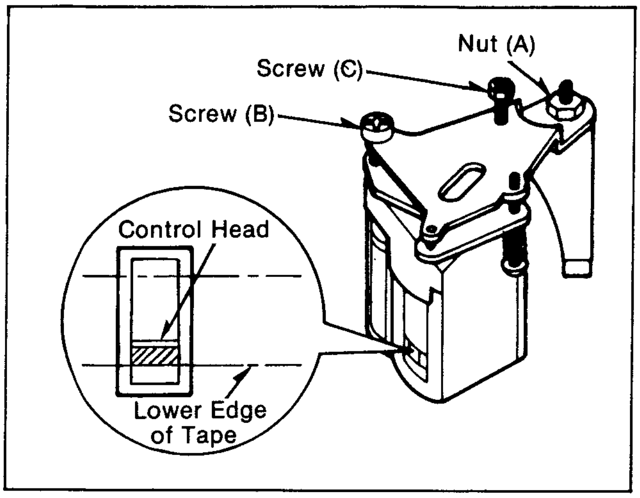


Figure M28 Confirmation of A/C Head Height

3-2-7. ADJUSTMENT OF THE A/C HEAD HEIGHT AND AZIMUTH

* Note: This procedure should be performed only when the A/C Head is replaced and posts heights are readjusted.

* Tools and Equipment Required:
Nut Driver (Purchase locally)
Alignment Tape..................VFM8180HMDH

1. Connect the scope CH1 to the HD/NOR Audio Output CH1 and the scope CH2 to the HD/NOR Audio Output CH2 on the jack panel.
2. Playback the 2nd portion (Normal Audio 6kHz) of the alignment tape, VFM8180HMDH.
3. Adjust the screw (B) so that the CH2 output level becomes maximum.(Figure M29)

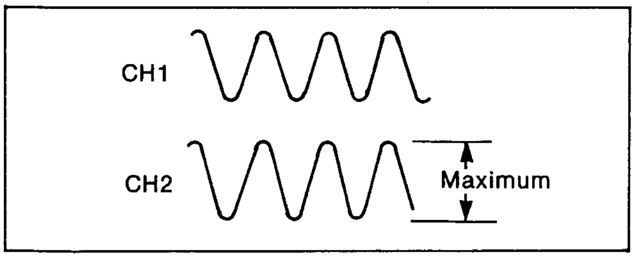


Figure M29 NORMAL AUDIO SIGNALS

4. Then adjust the nut (A) so that the CH2 envelope becomes maximum.
5. Readjust the screw (B) so that the phases of the both channels are matched as shown in Figure M30.

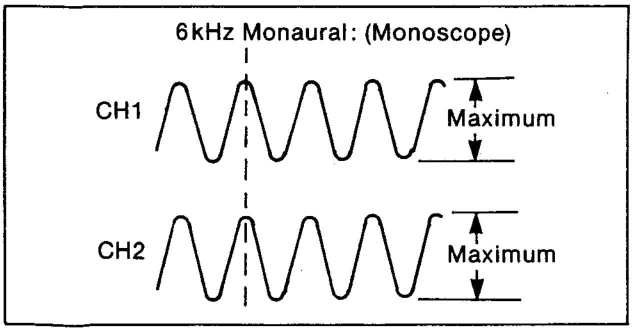


Figure M30 Adjustment of A/C Head Height and Azimuth-(3)

3-2-8. COARSE ADJUSTMENT OF THE A/C HEAD HORIZONTAL POSITION

* Note: This procedure should be performed only when the A/C head is replaced, and after performing the tape interchangeability adjustment.

* Tools and Equipment Required:
Alignment Tape..................VFM8180HMDH

1. Set the Tracking Control VR to the center detent (fixed) position.
2. Set the Audio Select SW to the NORM position.
3. Connect the scope to TP3007 on the video section and scope CH2 to the HD/Normal Audio Output CH2 on the jack Panel.
4. Playback 1st position (Monoscope and Normal Audio 3kHz)of the Alignment tape VFM8180HMDH.
5. Adjust A/C head horizontal position nut so that "T" width becomes 5msec as shown in Figure M31 and M32.

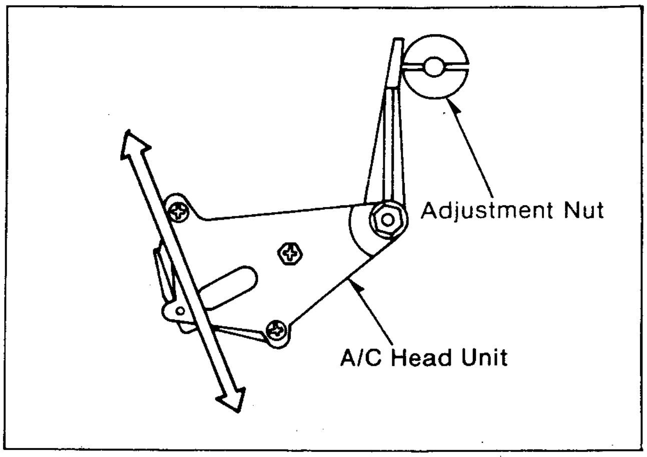


Figure M31 Coarse Adjustment of A/C Head

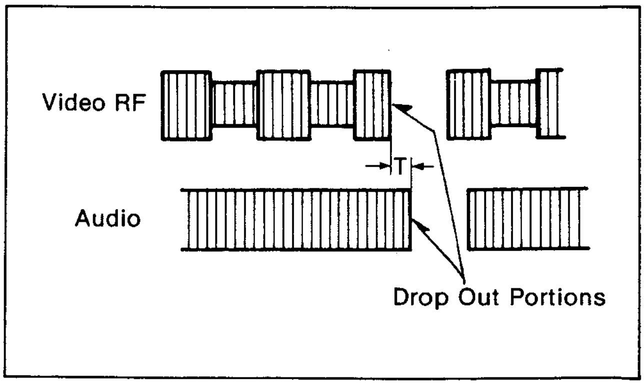


Figure M32 Horizontal Position Adjustment of A/C Head

* Note: After completion the fine adjustment of the A/C head horizontal position, the phase of Audio drop out and RF drop out may be changed slightly.

3-2-9. FINE ADJUSTMENT OF THE A/C HEAD HORIZONTAL POSITION (X-VALUE)

* Note: When the A/C head is replaced, the coarse adjustment of the A/C head horizontal position is required before performing this fine adjustment.

* Tools and Equipment Required:
H.Position Adj. Fixture...........VFK0328
Alignment Tape................VFM8180HMDH

1. Set the Tracking Control VR to the center detent (fixed) position.
2. Connect the scope CH1 to TP3007 on the Video Section and scope CH2 to TP3006 on the same section.
3. Playback 2nd position (Monoscope) of the Alignment tape, VFM8180HMDH.
4. Adjust the adjust nut so that the RF envelope output level becomes maximum at the detent position.
5. Turn the Tracking VR from end to end and then back to the detent position.
   Confirm that the FM envelope output level is maximized at the detent position.

4. OTHER MECHANICAL ADJUSTMENT PROCEDURES

4-1. CONFIRMATION OF BRAKE TORQUE

* Equipment Required:
Dial Torque Gauge...................VFK0133
Adaptor for Gauge...................VFK0134

1. Attach the adaptor to the torque gauge and place the deck in STOP mode. (Figure M32)
2. Place the torque gauge on the reel table. The weight of gauge should not rest on the reel table. (Figure M33)

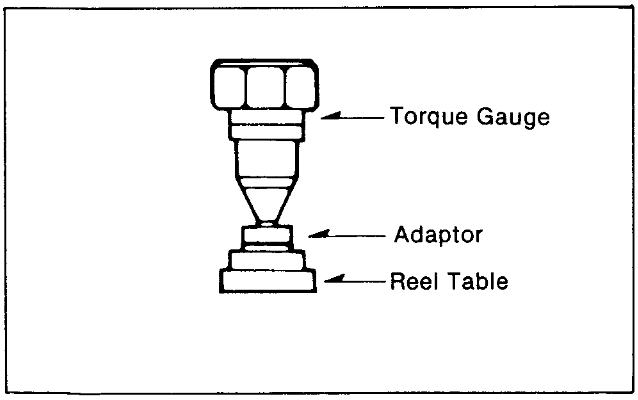
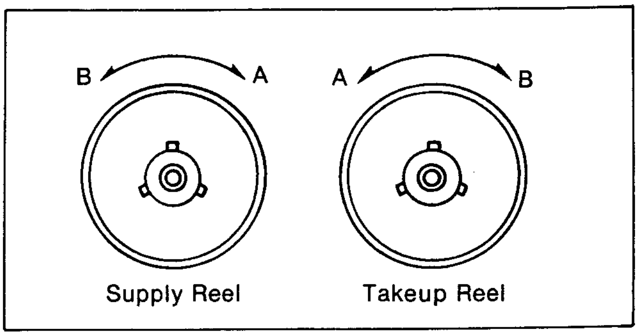


Figure M33 Confirmation of Brake Torque-(1)

3. Turn torque gauge in either direction indicated in the Figure M34 and read the gauge when the brake begins slipping.

* Notes:
1. If proper brake torque can not be obtained, clean the rotating surface of reel table with a soft cloth and recheck torque before replacing brake pad.



Reel	A	B
Takeup	300~1,200g-cm	more than 80g-cm
Supply	350~1,200g-cm	more than 40g-cm

Figure M34 Confirmation of Brake Torque-(2)

2. If proper brake torque can not be obtained after cleaning the rotating surface of reel table, replace the main brake units or reel tables.

4-2. CONFIRMATION OF BACK TENSION

* Equipment Required:
Back Tension Meter
VHS Cassette Tape (240 Minutes Tape)

* Specification: 25~30g

1. Pull the erase head in the direction indicated by the arrow and hold it by adhesive tape.
2. Play back the cassette tape from its beginning and wait until tape running has stabilized. (for approx. 10 to 20 seconds)
3. Insert tension meter in tape path and confirm reading. (Figure M35)

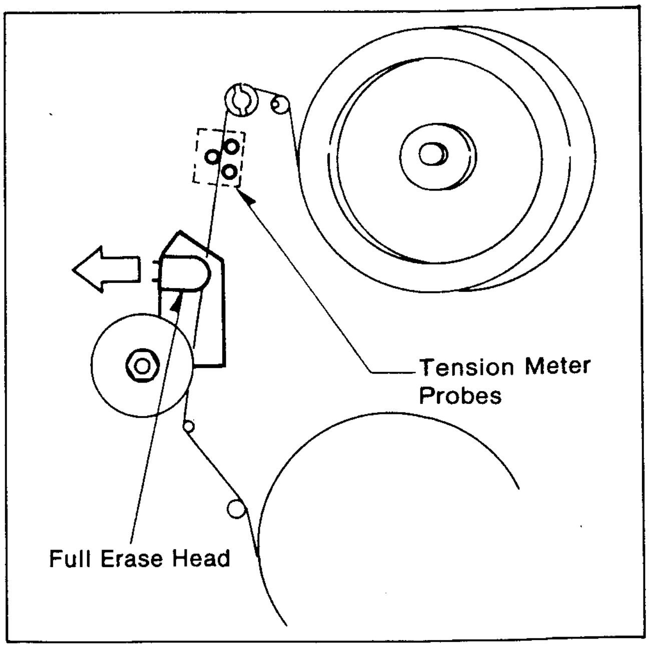


Figure M35 Confirmation of Back Tension

* Notes:
1. Make sure that the three probes of the meter are all in good contact with tape, but out of contact with any parts while measuring.
2. It is recommended to be measured three times as the tension meter is very sensitive.

4-3. HEIGHT ADJUSTMENT OF REEL TABLES

* Note: Cut-out on Post Adjustment Plate is reference of reel table height and their height is measured based on this reference.

* Equipment Required:
Post Adjustment Plate................VFK0191
Reel Table Height Fixture...........VFK0190

* Specification: 0~-0.15mm

1. Place the post adjustment plate over the reels, and put the fixture on the plate. Set the fixture to zero "0" with the foot scraper of the fixture touching the cut-out portion of the plate. (Figure M36)

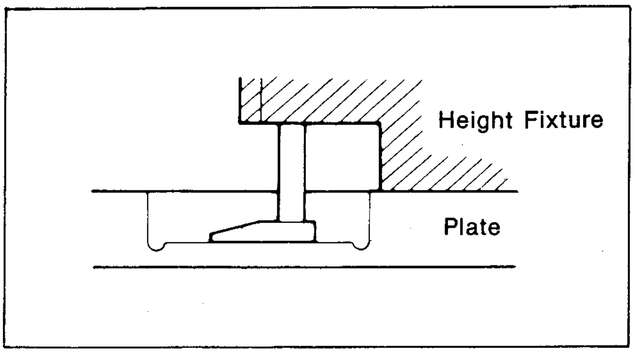


Figure M36 Height Adjustment of Reel Tables (1)

2. Then measure the top portion of reel table and confirm the difference just performed in former step. Do same for the other reel table. (Figure M37)

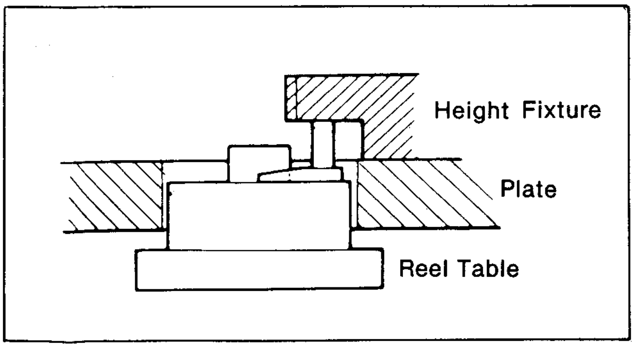


Figure M37 Height Adjustment of Reel Tables (2)

3. If a height difference in readings between the cut-out portion of plate and reel tables is not 0~0.15mm (higher or lower), adjust the height of the reel to obtain specified height.
4. For adjustment add or remove a washer located under the reel table. (Figure M38)

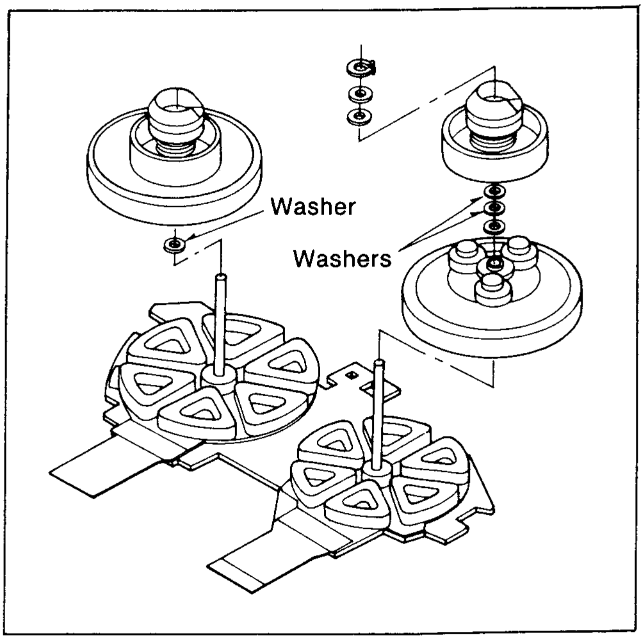


Figure M38 Height Adjustment of reel Tables (3)

* Notes: When adjusting the height of the tables, the DD Reel Unit needs to be removed from the chassis.
(Removal of the DD Reel Unit.)
Remove 7 screws and carefully lift it out.
(Figure M39)

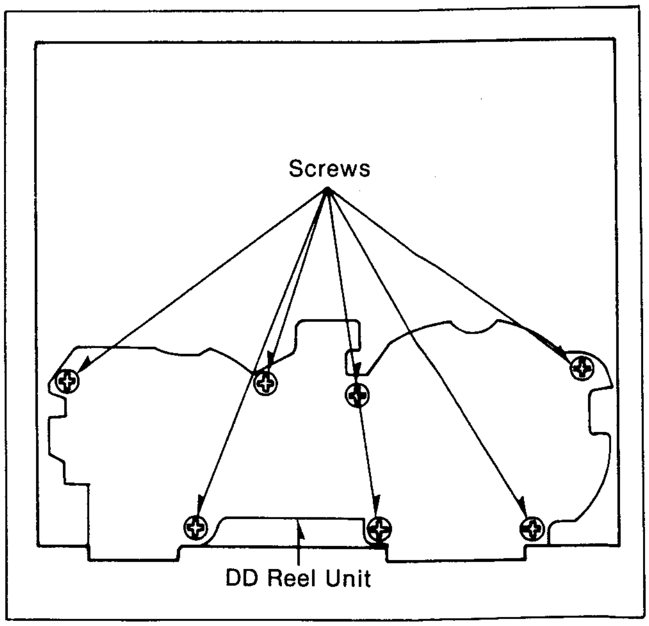


Figure M39 Bottom View of DD Reel Unit

4-4. ADJUSTMENT OF F.G. HEAD GAP

* Specification: 0.18(+−0.02)mm

1. Slightly loosen the 2 screws.
2. Hold the F.G Head Unit with your fingers, and adjust the gap as specified.
3. After adjustment, tighten 2 screws. (Figure M40)

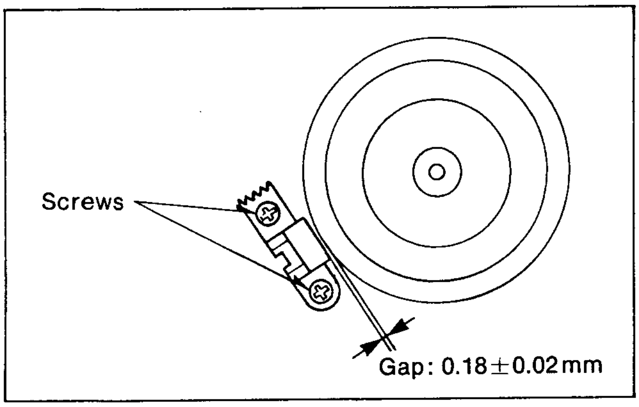


Figure M40 Adjustment of FG.Head Gap

* Note: Do not scratch the F.G. Head or outside surface of the rotor.

4-5. ASSEMBLY AND ADJUSTMENT OF GEARS AND ROD

GENERAL CONDITION

The mechanism of this model is mostly engaged to the System Control Circuit, through the mode select switch.

Therefore the relation between the mode select switch and the cam gear decides all further mechanical movement of the mechanical parts such as levers, gears, rollers and so on.

If the adjustment of this item is performed improperly, the deck will be unloaded or compulsorily stopped.

And it may result in damage to mechanical or electrical parts.

4-5-1. ADJUSTMENT OF LOADING ARM

1. Install the supply and takeup loading arm units so that the projection (A) on the takeup loading gear aligns with the projection (B) on the supply loading gear.
   Then install the 2 retaining rings on the supply loading gear and on the takeup loading gear.
   Ensure that the loading arm units are still in the fully unloaded condition. (Figure M41)

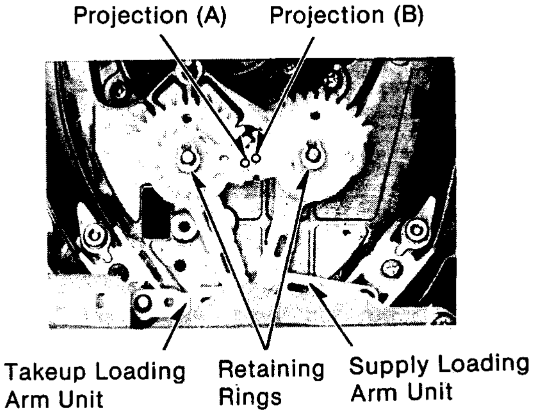


Figure M41 Assembly and Adjustment of Gears and Rod−(1)

* Note: Pay attention that the washers are still under the loading gears.

4-5-2. ADJUSTMENT OF CAM GEAR

1. Make sure the position of Loading Arm is as Figure M41 before proceeding with this adjustment.
2. Install the cam gear so that the hole on the cam gear meets the hole on the chassis. Then install the retaining ring.(Figure M42)

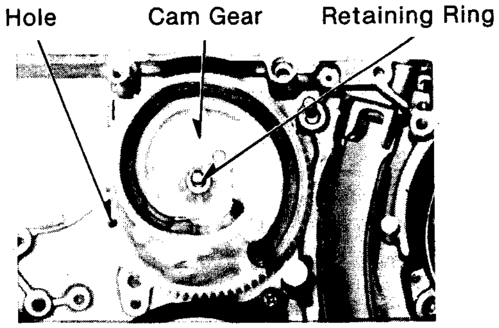


Figure M42 Assembly and Adjustment of Gears and Rod−(2)

3. Install the lock arm as shown in Figure M43. Then install the retaining ring and the washer.

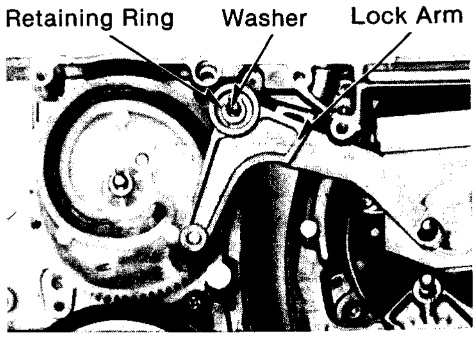


Figure M43 Assembly and Adjustment of Gears and Rod−(3)

* Note: Pay attention that the washer is still under the lock arm.

4-5-3. ADJUSTMENT OF LOCK GEAR

1. Perform the adjustment after making sure the mechanism position is as described in previous item 4-5-1 and 4-5-2.
2. Install the lock gear so that the projection (C) on the lock gear aligns with the projection (D) on the takeup loading gear.

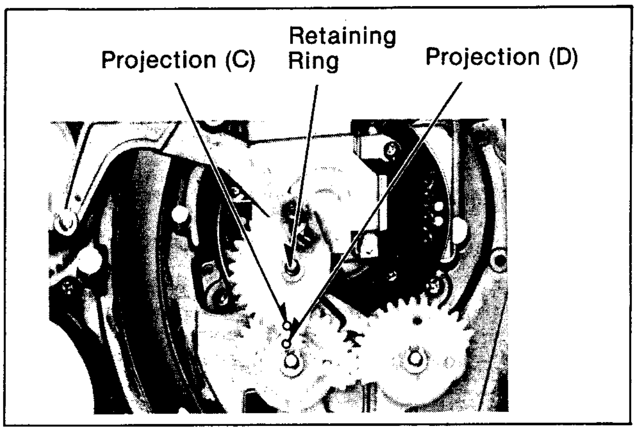

Projection (C)
Retaining Ring
Projection (D)

Figure M44 Assembly and Adjustment of Gears and Rod-(4)

3. Install the support plate with the screw.

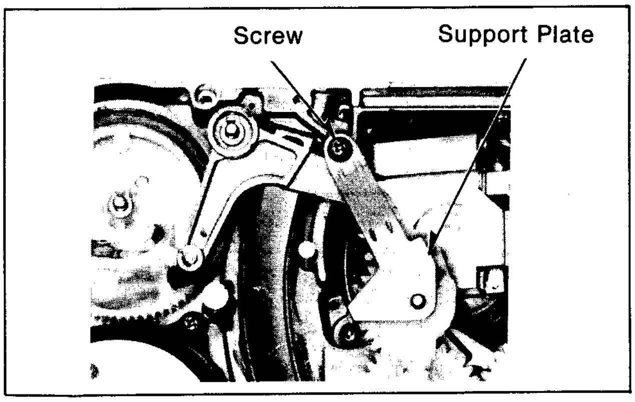

Screw
Support Plate

Figure M45 Assembly and Adjustment of Gears and Rod-(5)

4-5-4. ADJUSTMENT OF MODE SELECT SWITCH

1. Perform this adjustment after making sure the mechanism position is as described in previous item 4-5-1, 4-5-2 and 4-5-3.
2. Rotate the gear on the mode select switch so that it is in click (detent) position. Then install the mode select switch so that the delta hole (E) on the rotary switch gear aligns with the projection (F) on the cam gear, and install the 2 screws. (Figure M46)

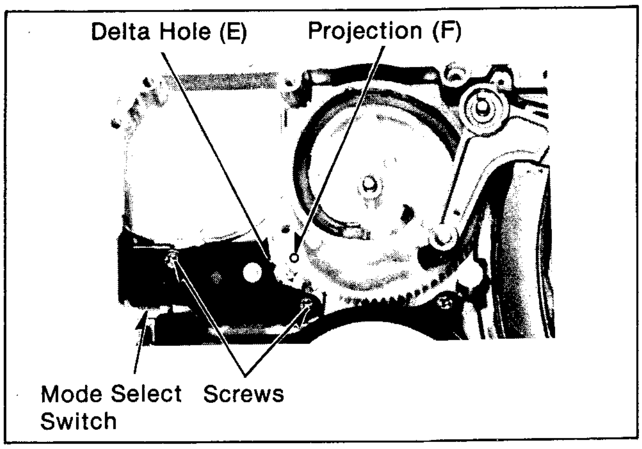

Delta Hole (E)
Projection (F)
Mode Select Switch
Screws

Figure M46 Assembly and Adjustment of Gears and Rod-(6)

* Note: There is one click point per 4 rotations.

3. Install the loading motor with 2 screws. (Figure M47)

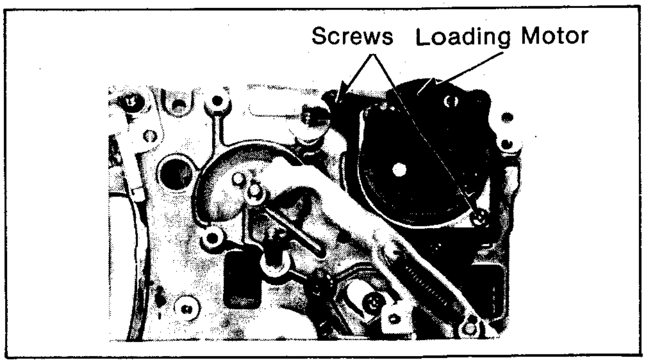

Screws
Loading Motor

Figure M47 Assembly and Adjustment of Gears and Rod-(7)

4. Confirm that the cam gear is in the EJECT condition.

4-5-5. ASSEMBLY PROCEDURE OF MAIN ROD, BRAKE ARM, BRAKE CAM GEAR

1. Perform the assembly after making sure the mechanism position is as described in previous item A,B,C, and D.
2. Install the main rod so that the hole on the main rod meets the hole on the chassis. Then install the brake arm, the brake cam gear, the washer and the 3 retaining rings. (Figure M48)

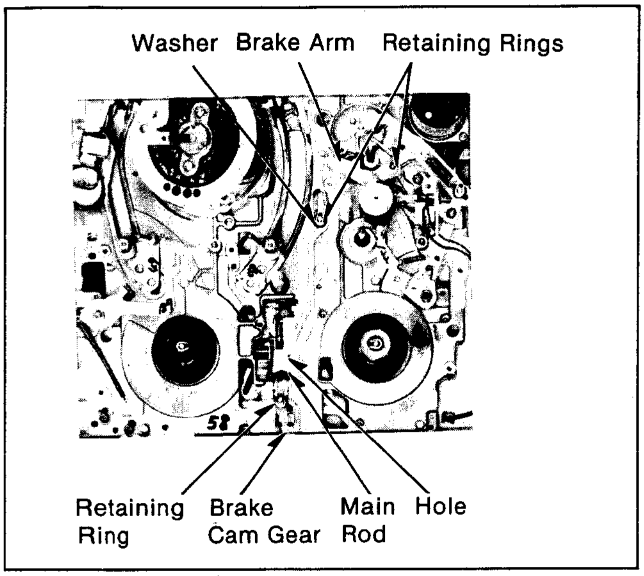

Washer
Brake Arm
Retaining Rings
Retaining Ring
Brake Cam Gear
Main Rod
Hole

Figure M48 Assembly and Adjustment of Gears and Rod–(8)

4-6. ADJUSTMENT OF LEAF SWITCH

* Equipment Required:
Fine Adjustment Screwdriver...........VFK0330

* Specification: 0.9mm∼1.3mm

1. Remove the DD Reel Unit from the chassis. Slightly loosen the screw (A) and insert the Fine Adjustment Screwdriver to the Hole (B).
2. By rotating the Fine Adjustment Screwdriver, adjust the leaf switch so that gap (C) is 0 and the gap (D) between the upper and lower plates of the leaf switch is 0.9mm to 1.3mm, and tighten screw (A).
3. Install the DD Reel Unit. (Figure M49)

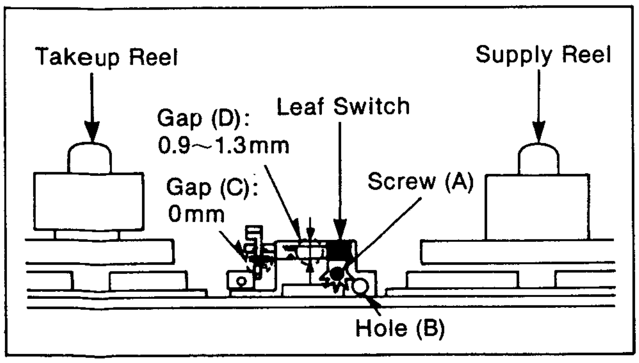

Takeup Reel
Supply Reel
Gap (D): 0.9∼1.3mm
Leaf Switch
Gap (C): 0mm
Screw (A)
Hole (B)

Figure M49 Adjustment of Leaf Switch

* Note: After adjustment, confirm that the leaf switch turns On when the Cassette Up Unit is pressed down, and turns Off when the Cassette Up Unit is raised.

4-7. POSITION ADJUSTMENT OF RECORDING SAFETY SWITCH

* Equipment Required:
Cassette Holder Fixture..............VFK0188
Fine Adjustment Screwdriver..........VFK0330

1. Place the fixture in place over the reel tables.
2. Confirm Rec. Safety Switch position is just turned ON.
3. When Rec. Safety Switch position is not right, remove the fixture and loosen a screw (A).
4. Insert the fine adjustment screwdriver into the hole (B), and adjust the position. Then tighten the screw (A).
5. Reinstall the fixture and confirm again.(Figure M50)

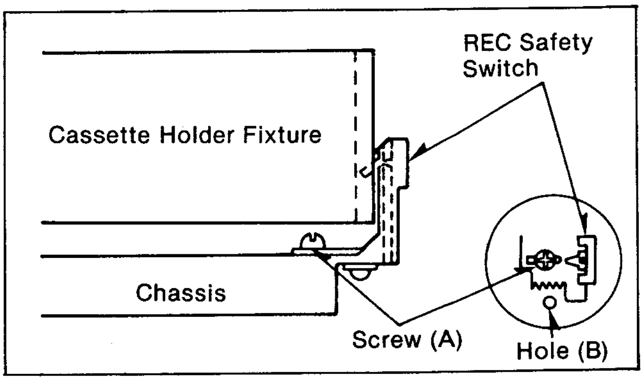

REC Safety Switch
Cassette Holder Fixture
Chassis
Screw (A)
Hole (B)

Figure M50 Position Adjustment of Recording Safety Switch–(1)

* Note: cassette with a safety tab is used, the Rec Safety switch Turns on and without a tab, it opens. (Figure M51)

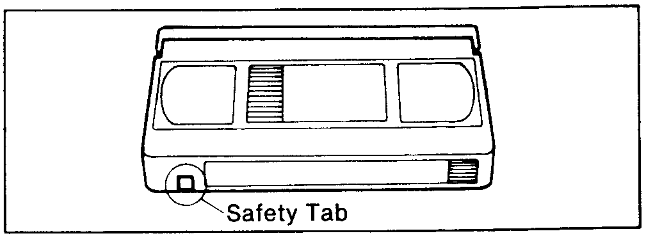


Figure M51 Position Adjustment of Recording Safety Switch–(2)

ELECTRICAL ADJUSTMENT PROCEDURES

This section provides complete electrical adjustment procedures which may be required for electronic circuits of VHS Video Cassette recorders AG-6400.

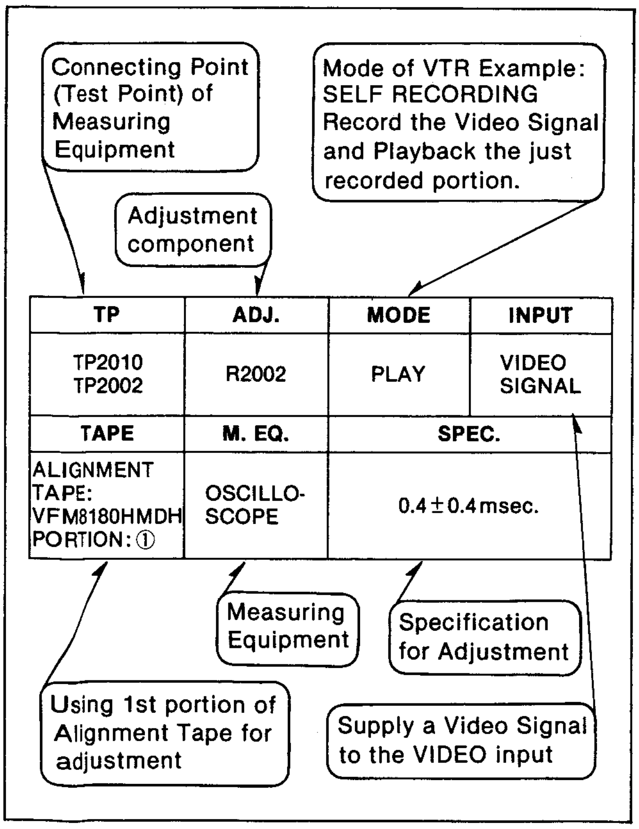
1. TEST AND SERVICE EQUIPMENT

To perform the electrical adjustments completely, following equipments are required.

1. VTVM (Vacuum Tube Volt Meter) or DVM (Digital Volt Meter)
   Voltage Range: 0.001~50V
2. Dual-Trace Oscilloscope
   Voltage Range: 0.005~50V/div.
   Frequency Range: DC~10MHz
   Probes: 10:1 or 1:1
3. Frequency Counter
   Frequency Range: 0~10MHz
4. Signal Generator (Sinewave)
   Frequency Range: 0~10MHz
5. Video Sweep Generator
   Frequency Range: 0~10MHz
6. Colour Monitor TV
7. Plastic Tip Driver
8. VHS Alignment Tape (VFM8180HMDH)
9. DC Power Supply Unit (More than 15V,5A)

2. ADJUSTMENT PROCEDURES

2-1. HOW TO READ THE ADJUSTMENT PROCEDURES


Connecting Point (Test Point) of Measuring Equipment
Mode of VTR Example: SELF RECORDING Record the Video Signal and Playback the just recorded portion.
Adjustment component
Measuring Equipment
Specification for Adjustment
Using 1st portion of Alignment Tape for adjustment
Supply a Video Signal to the VIDEO input

TP	ADJ.	MODE	INPUT
TP2010 TP2002	R2002	PLAY	VIDEO SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
ALIGNMENT TAPE: VFM8180HMDH PORTION: ①	OSCILLO-SCOPE	0.4±0.4msec.	

Figure E1

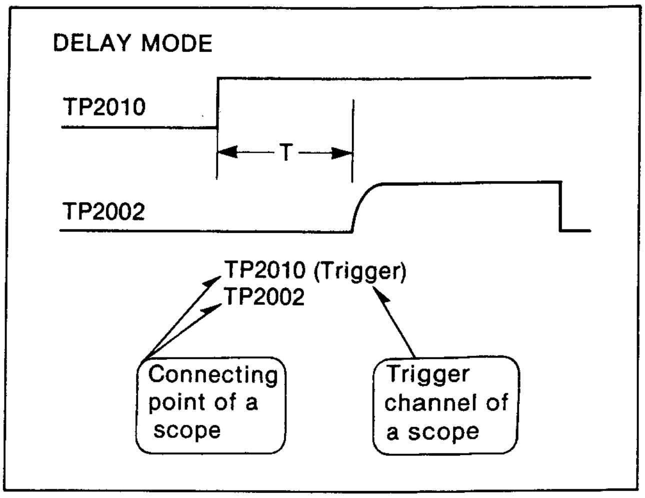

DELAY MODE
TP2010
T
TP2002
TP2010 (Trigger)
TP2002
Connecting point of a scope
Trigger channel of a scope

Figure E2

2-2. POWER SUPPLY SECTION

2-2-1. REG +5V ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP1001	R1015	STOP	
TAPE	**M. EQ.**	**SPEC.**	
	D.V.M	5.1±0.1V	

Note:
1. Supply the DC to the deck using the AC adaptor Model AG-B640.
2. This specification should be confirmed before any other item because this voltage will affect overall circuit.

2-3. SYSTEM CONTROL SECTION

2-3-1. REG +9V ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP6004	VR6002	STOP	
TAPE	**M. EQ.**	**SPEC.**	
	D.V.M	$9.3^{+0.4}_{-0.5}$V	

1. Supply the DC to the deck using the AC adaptor model AG-B640.
2. Befor this adjustment,"REG +5V ADJUSTMENT" must be completed.

2–3–2. UNDER CUT VOLTAGE ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP6002	VR6001	REC•PLAY	
TAPE	**M. EQ.**	**SPEC.**	
	D.V.M		

1. Connect the DC voltage (10.6+–0.05VDC) to P6007–2(+) and P6007–3(–).
2. Turn VR6001 to the position where the indication of the D.V.M at TP6002 becomes Low level from High level.

2–3–3. V BLANKING SWITCH ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP6601	R6619	REC • PLAY/ PLAY BACK	COLOUR BAR SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	OSCILLO-SCOPE	T=18.5±0.2msec.	

1. Adjust R6619 so that "T" period is 18.0 +– 0.2 [msec] at TP6601 during recording mode.

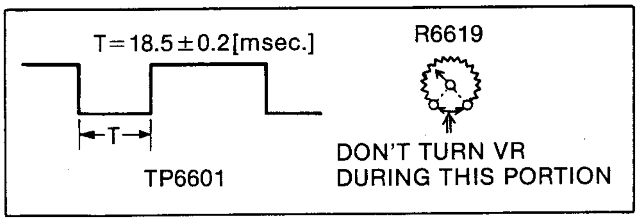

T=18.5±0.2[msec.]
R6619
T
TP6601
DON'T TURN VR
DURING THIS PORTION

Figure E3

2. After adjusting, repeat recording mode and recording pause mode (add on recording), and play back the just recorded portion.
3. Check the picture on the monitor which is set to under scan mode so that the cut–in point appears as shown below.
4. If the cut–in point appears above the HSW point, "T" should be adjusted to 19[msec], and repeat 2 and 3.
5. If the cut–in point appears under V sync or in V sync, "T" should be adjusted to 17 [msec], and repeat 2 and 3.

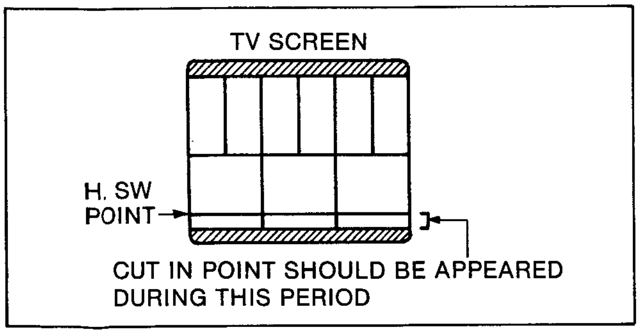

TV SCREEN
H. SW
POINT
CUT IN POINT SHOULD BE APPEARED
DURING THIS PERIOD

Figure E4

2-4. SERVO SECTION

2–4–1. PG SHIFTER ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP2006 TP3005	R2005	PLAY	
TAPE	**M. EQ.**	**SPEC.**	
ALIGNMENT TAPE: VFM8180HMDH PORTION:②	OSCILLO-SCOPE	6±0.5H	

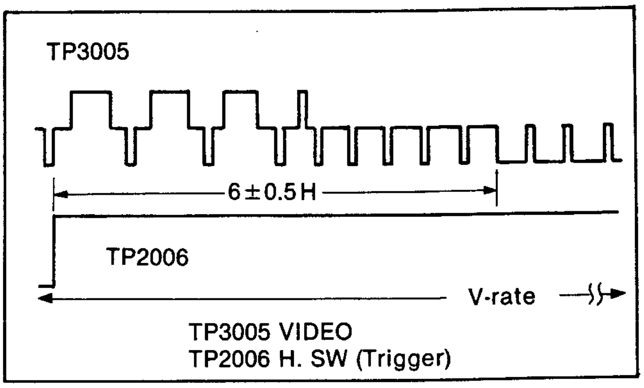

TP3005
6±0.5H
TP2006
V-rate
TP3005 VIDEO
TP2006 H. SW (Trigger)

Figure E5

2–4–2. TRACKING FIX ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP2002 TP2006	R2021	SELF RECORDING P.B. THE PORTION	VIDEO SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	OSCILLO-SCOPE	T=13.4±0.4msec.	

1. TRACKING VR is fix position.
2. Adjust R2021 so that the period of "T" becomes 13.4+–0.4msec.as shown Figure.E4.

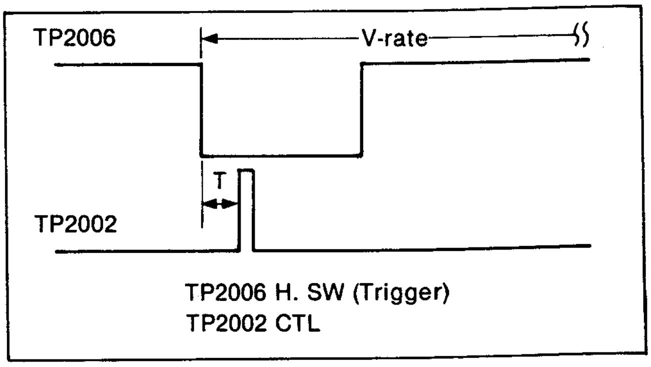

TP2006
V-rate
T
TP2002
TP2006 H. SW (Trigger)
TP2002 CTL

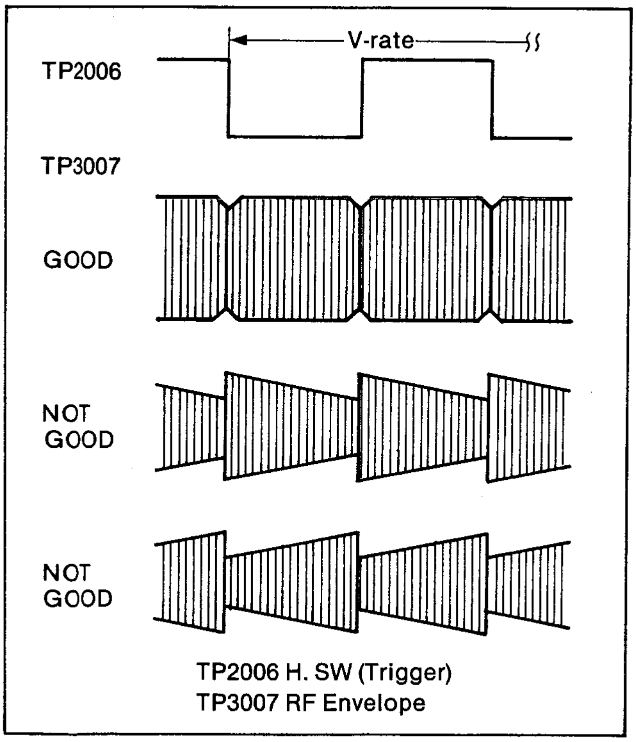
Figure E6

2–4–3. FINE SLOW SPEED ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3007 TP2006	R2068	SELF RECORDING	VIDEO SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	OSCILLO-SCOPE		

Note:
Before this adjustment, "Tape Interchangeability Adjustment" must be completed.

1. FINE SLOW TRACKING VR is center position.
2. Play back the just recorded portion in Fine Slow mode.
3. Adjust R2068 so that the RF envelope at TP3007 is as linear as possible.


V-rate
TP2006
TP3007
GOOD
NOT GOOD
NOT GOOD

TP2006 H. SW (Trigger)
TP3007 RF Envelope

Figure E7

2–4–4. ARTIFICIAL V–SYNC ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP2006 IC2004-⑱	R2048	SELF RECORDING	VIDEO SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	OSCILLO-SCOPE	t≦20μsec.	

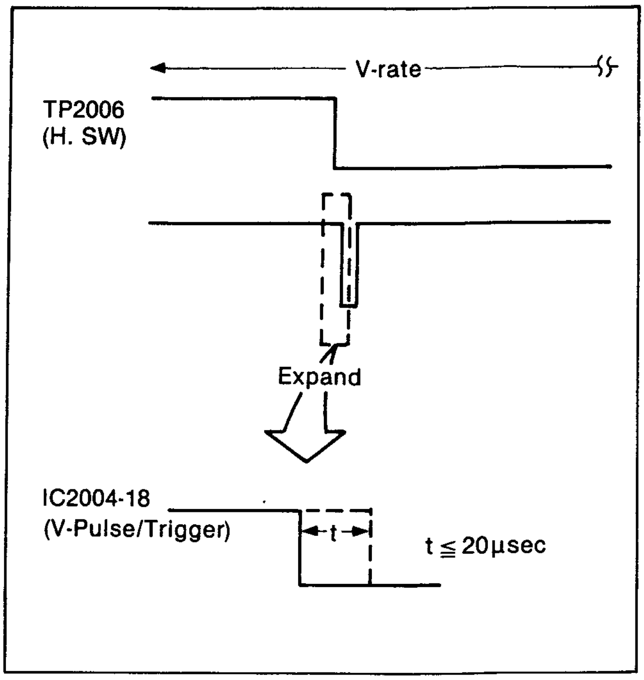

V-rate
TP2006
(H. SW)
Expand
IC2004-18
(V-Pulse/Trigger)
t
t ≦ 20μsec

Figure E8

2-5. LUMINANCE & CHROMINANCE SECTION

2–5–1. E–E LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
VIDEO OUT	VR3001	STOP	COLOUR BAR SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
	OSCILLO-SCOPE	1.0±0.05Vp-p	

1. Connect the oscilloscope to the VIDEO OUTPUT terminated at 75 ohm.

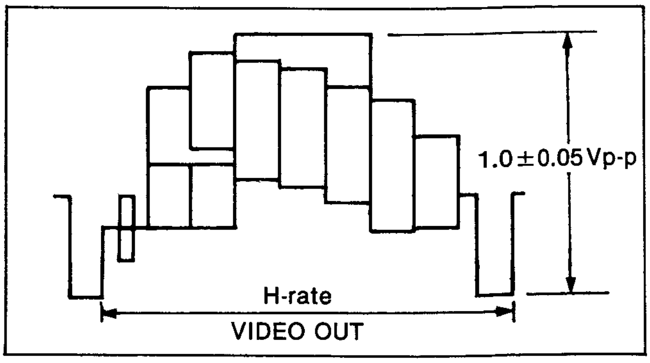

1.0±0.05Vp-p
H-rate
VIDEO OUT

Figure E9

2–5–2. DETAIL ENHANCER LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3001	VR3002	STOP	VIDEO SWEEP
TAPE	**M. EQ.**	**SPEC.**	
	OSCILLO-SCOPE	V=54±5mVp-p	

1. Supply the following signal to the VIDEO Input.

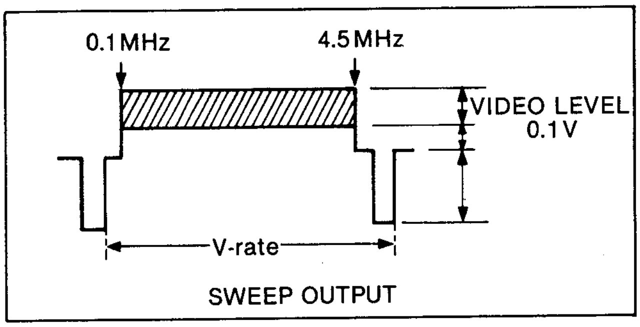

0.1MHz
4.5MHz
VIDEO LEVEL
0.1V
V-rate
SWEEP OUTPUT

Figure E10

2. Set the video level of the sweep output so that the video level of 0.1MHz portion at TP3002 becomes 38 mVp–p
3. Adjust VR3002 so that "V" level becomes 54+–5mVp–p.

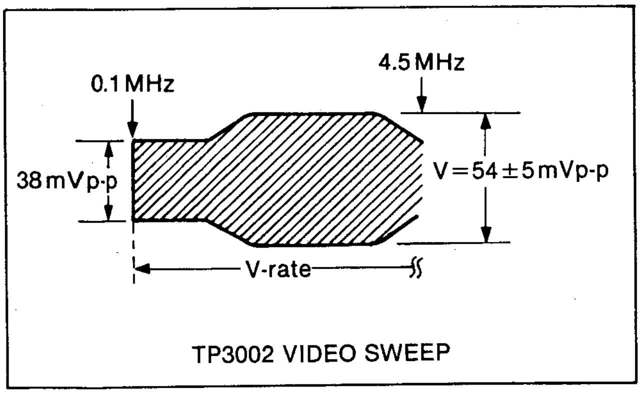

4.5MHz
0.1MHz
38mVp-p
V=54±5mVp-p
V-rate
TP3002 VIDEO SWEEP

Figure E11

2–5–3. CHROMINANCE RECORDING CURRENT ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3003 (HOT) TP3008 (GND)	VR8001	REC•PLAY	COLOUR BAR SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	OSCILLO-SCOPE	30±4mVp-p	

Note:
1. Turn VR3003 so that the Luminance Rec Current becomes minimum to adjust the chrominance Rec Current.
2. To achieve this adjustment keep up to deck in the REC/PLAY mode for approximetely 30 seconds.

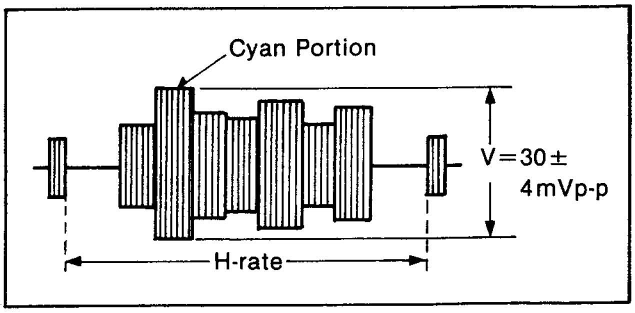

Cyan Portion
V=30±
4mVp-p
H-rate

Figure E12

2–5–4. LUMINANCE RECORDING CURRENT ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3003 (HOT) TP3008 (GND)	VR3003	REC•PLAY	COLOUR BAR SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	OSCILLO-SCOPE	120±5mVp-p	

Note:
To achieve is adjustment keep up the deck in the REC/PLAY MODE for approximately 30 seconds.

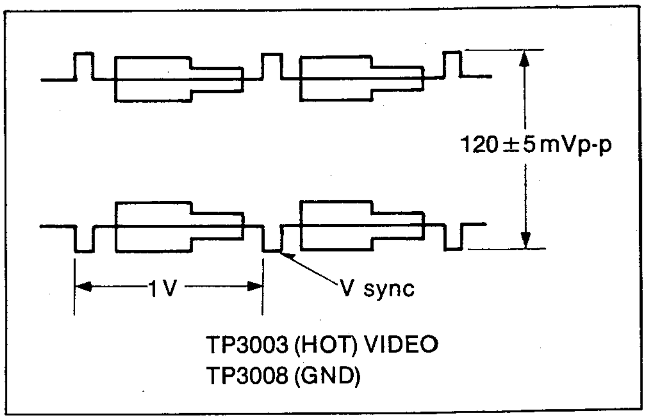

120±5mVp-p
1V
V sync
TP3003 (HOT) VIDEO
TP3008 (GND)

Figure E13

2–5–5. LUMINANCE FREQUENCY CHARACTERISTIC ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3005	VR3008	SELF RECORDING	VIDEO SWEEP
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	OSCILLO-SCOPE	B/A=110±10%	

1. Supply the following signal to the VIDEO INPUT at the 75 ohm termination.

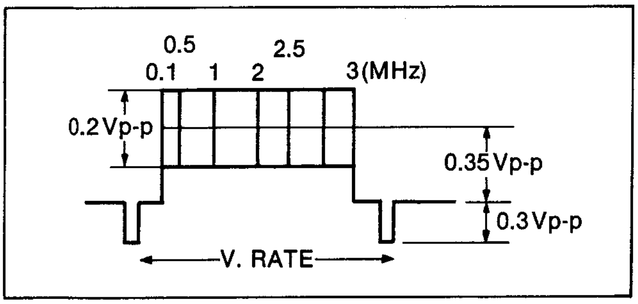


Figure E14

2. Play back the just recorded portion and set the PICTURE VR to its centre position.
3. Adjust VR3008 so that B/A is 110 +– 10% in both channels (L and R channels).

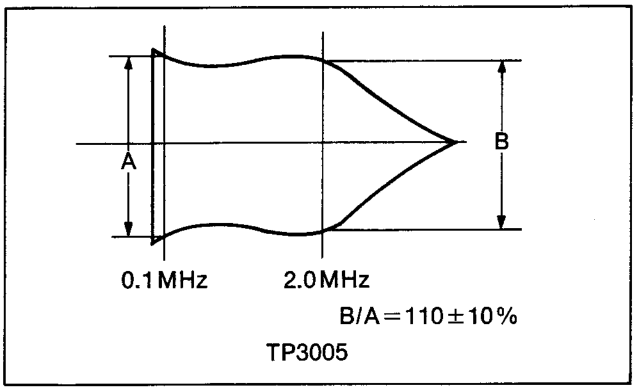


Figure E15

2-6. AUDIO SECTION

2–6–1. AUDIO INPUT/OUTPUT LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
LINE OUT	NORMAL: VR4009 VR4010 HD: VR4506 VR4507	STOP	1kHz –10dB AUDIO SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
	V.T.V.M	–8±0.1dB	

1. Supply audio signal (1kHz, –10dB = 0.32Vrms =0.89Vp–p) to the LINE IN jacks and set the normal audio and HD select switches to LINE position.
2. Set the all audio input VRs to their centre position and the audio output select switch to NORMAL position.
3. Adjust VR4009 (CH1) and VR4010 (CH2) so that the output levels are –8 +– 0.1dB. (=0.4Vrms=1.1Vp–p)
4. Set the audio output select switch to HD position.
5. Adjust VR4506 (CH1) and VR4507 (CH2) so that the output levels are –8+–0.1dB. (=0.4Vrms = 1.1Vp–p)

2–6–2. AUDIO LEVEL METER ADJUSTMENT

TP	ADJ.	MODE	INPUT
	VR4205 (CH1) VR4206 (CH2)	STOP	1kHz, –10dB AUDIO SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
		0dB	

1. Supply audio signal (1KHz, –10dB=0.32Vrms=0.89Vp–p) to the LINE IN jacks.
2. Confirm the normal audio output is –8dB (0.4Vrms=1.1Vp–p).
3. Adjust VR4205 (CH1) and VR4206(CH2) so that the indications of audio level meters are "0" point.

2–6–3. NORMAL AUDIO PLAYBACK LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP4401 (CH1) TP4402 (CH2)	VR4001 (CH1) VR4002 (CH2)	PLAY	
TAPE	**M. EQ.**	**SPEC.**	
ALIGNMENT TAPE: VFM8180HMD PORTION: ③	OSCILLO-SCOPE	300mVp-p (400Hz PORTION)	

1. Set the Dolby switch to off mode.

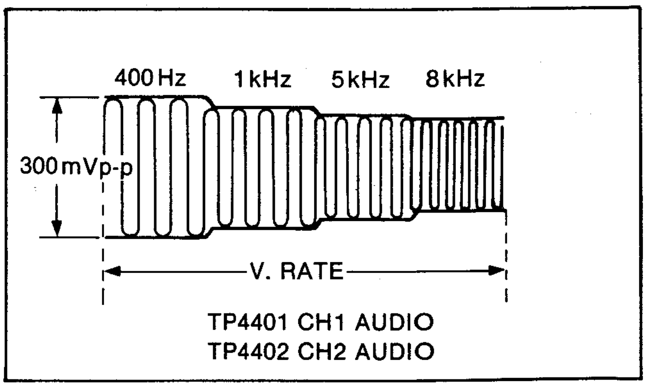


Figure E16

2–6–4. NORMAL AUDIO PLAYBACK FREQUENCY RESPONSE ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP4401 (CH1) TP4402 (CH2)	VR4007 (CH1) VR4008 (CH2)	PLAY	
TAPE	**M. EQ.**	**SPEC.**	
ALIGNMENT TAPE: VFM8180HMDH PORTION: ③	OSCILLO-SCOPE	0±2dB (79%~126%)	

1. Set the Dolby switch to off mode.
2. Adjust VR4007(CH1) and VR4008(CH2) so that the difference between the levels at 400Hz portion and 8KHz portion becomes 0+–2dB (–21%+26%).

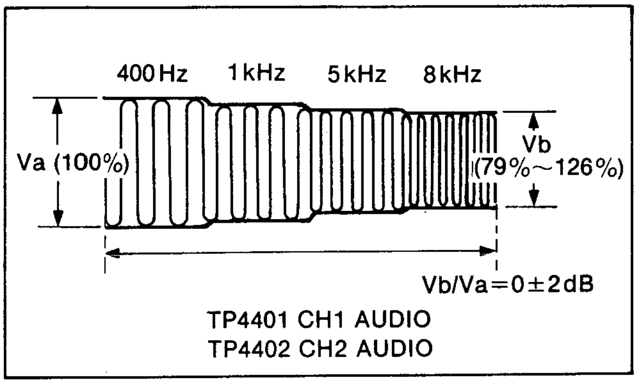


Figure E17

2–6–5. NORMAL AUDIO BIAS CURRENT ADJUSTMENT

TP	ADJ.	MODE	INPUT
A/C HEAD CONNECTOR	VR4003 (CH1) VR4004 (CH2)	REC•PLAY	
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	V.T.V.M	1.9±0.1mVrms	

1. Connect the V.T.V.M to the A/C head connector with a coaxial cable(3C2V) which is less than 1m as shown below.

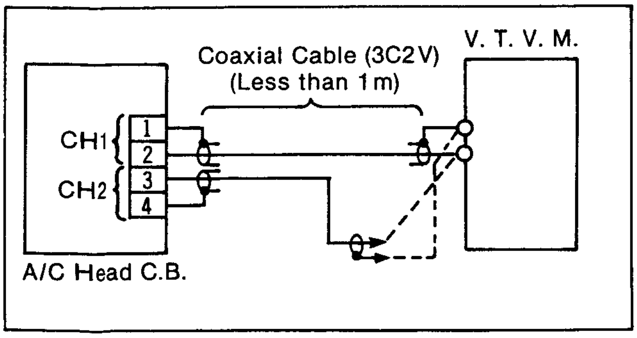


Figure E18

2–6–6. NORMAL AUDIO RECORDING CURRENT ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP4001 (CH1) TP4002 (CH2) LINE OUT	VR4005 (CH1) VR4006 (CH2)	SELF RECORDING	1kHz, –10dB AUDIO SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	V.T.V.M	0±0.5dB	

1. Supply a audio signal (1KHz,–10dB=0.32Vrms =0.89Vp–p) to the LINE INPUT jacks.
2. Adjust VR4005 (CH1) and VR4006(CH2) so that the voltages at TP4001(CH1) and TP4002(CH2) becomes 350mVrms(10mVp–p) in REC mode. Then read the voltage values "A(CH1)" and "B(CH2)" at the LINE OUT jacks. 3. Play back the just recorded portions, and read the voltage values "A'(CH1)" and "B'(CH2)" at the LINE OUT jacks.
4. If the difference between "A(CH1)" and "A'(CH1)" is more than 0+–0.5dB, adjust VR4005(CH1) so that the difference decreases.
5. If the difference between "B(CH2)" and "B'(CH2)" is more than 0+–0.5dB, adjust VR4006(CH2) so that the difference decreaces.
6. Repeat self recording and playback,and compare the EE level and playback level.
7. If the differences between the EE levels and the playback levels are out of specification, adjust VR4005(CH1) and VR4006(CH2) so that the differences are decrease.
8. Repeat item 7 till the differences are into the Specification.

2–6–7. HD AUDIO HEAD SW SHIFTER ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP2006 TP4509	VR4505	PLAY	
TAPE	**M. EQ.**	**SPEC.**	
ALIGNMENT TAPE: VFM8180HMDH PORTION: ②	OSCILLO-SCOPE	$T=6.67^{+0\text{msec.}}_{-0.05\text{msec.}}$	

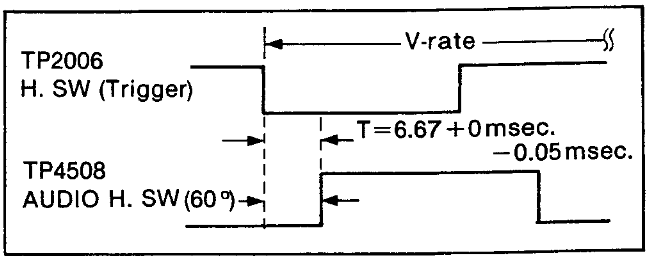


Figure E19

2–6–8. HD AUDIO RECORDING CURRENT ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP4503 (GND) TP4504 (HOT)	VR4504	REC•PLAY	
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	OSCILLO-SCOPE	220±5mVp-p	

1. Connect two jumper wires between LINE IN jacks and GND.
2. Connect a jumper wire between TP4505 and GND.

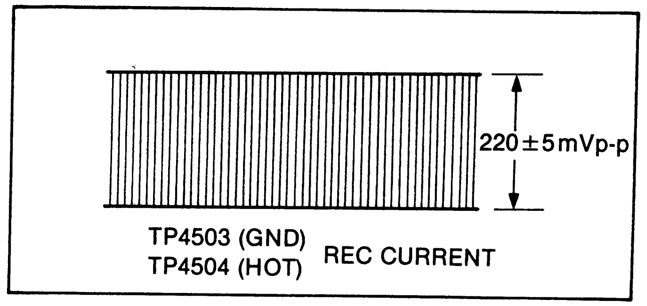


Figure E20

2–6–9. HD AUDIO PLAYBACK LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
LINE OUT	VR4501 (CH1) VR4503 (CH2)	SELF RECORDING	1kHz, −10dB AUDIO SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	V.T.V.M	E-E LEVEL±0.5dB	

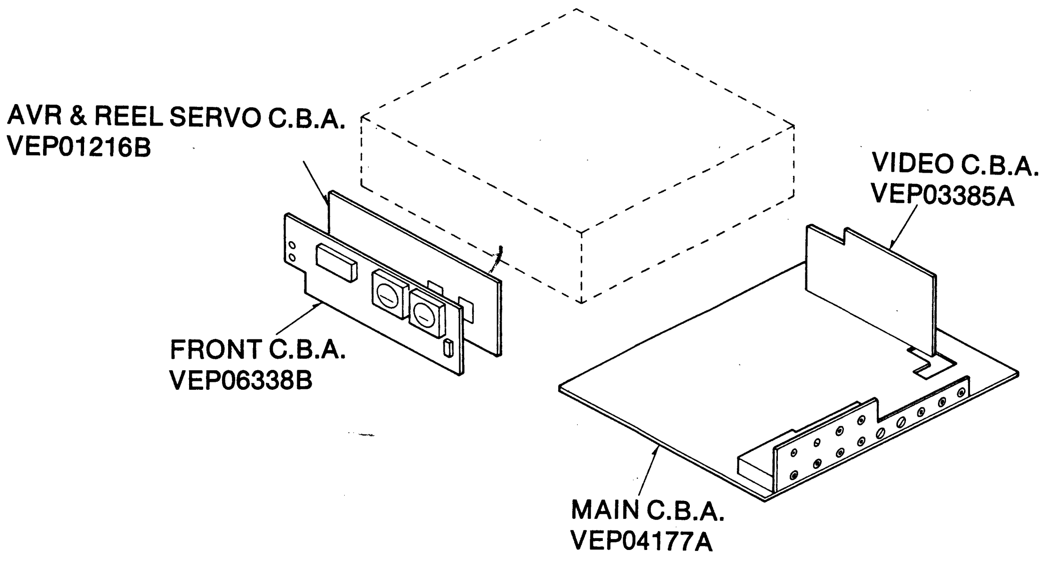
1. Supply audio signal (1kHz, −10dB = 0.32Vrms= 0.89Vp–p) to the LINE INPUT jacks.
2. Place the deck in the REC/PLAY mode, and at the same time, read the levels at CH1 and CH2 LINE OUTPUTS.
3. Play back the portion just recorded and adjust VR4501(CH1) and VR4503(CH2) so that the levels at CH1 and CH2 LINE OUTPUTS become +–0.5dB of the E–E levels.
[If E–E levels are −8dB(0.4Vrms=1.12Vp–p), Playback levels should be −7.5dB∼−8.5dB(0.42Vrms∼0.38Vrms=1.2Vp–p∼1.06Vp–p)]

2–6–10. HD AUDIO MUTE LEVEL ADJUSTMENT

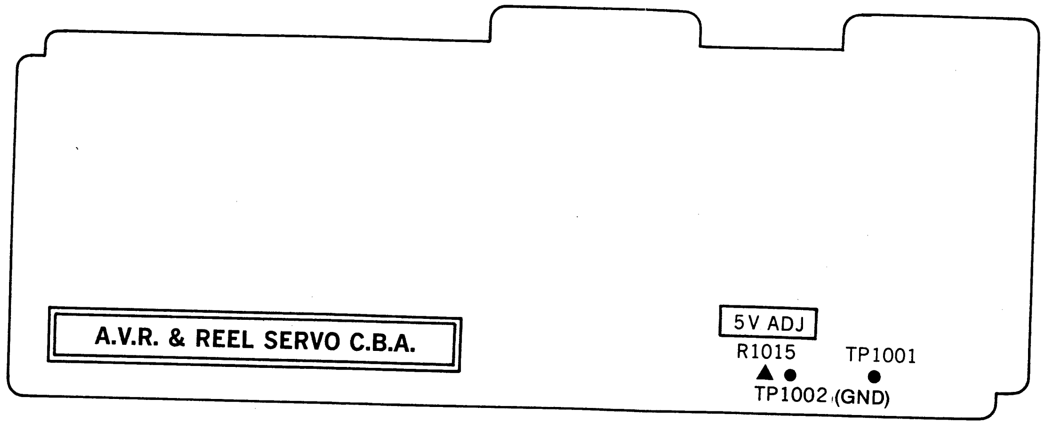
TP	ADJ.	MODE	INPUT
AUDIO LINEOUT	VR4502	PLAYBACK	
TAPE	**M. EQ.**	**SPEC.**	
ALIGNMENT TAPE VFM8180HMD PORTION:①	OSCILLO-SCOPE		

1. Play back the 1st portion of the alignment tape.
2. Connect the oscilloscope to AUDIO LINE OUT CH1 or CH2, and set the audio output select switch to HD position.
3. Adjust VR4502 to the point in which HD audio signal is just muted.
4. If HD audio signal is not muted by turning VR4502, turn VR4502 fully clockwise viewing from the bottom side.
5. If HD audio signal is always muted by turning VR4502, turn VR4502 fully counterclockwise

LOCATION OF TEST POINTS & CONTROLS

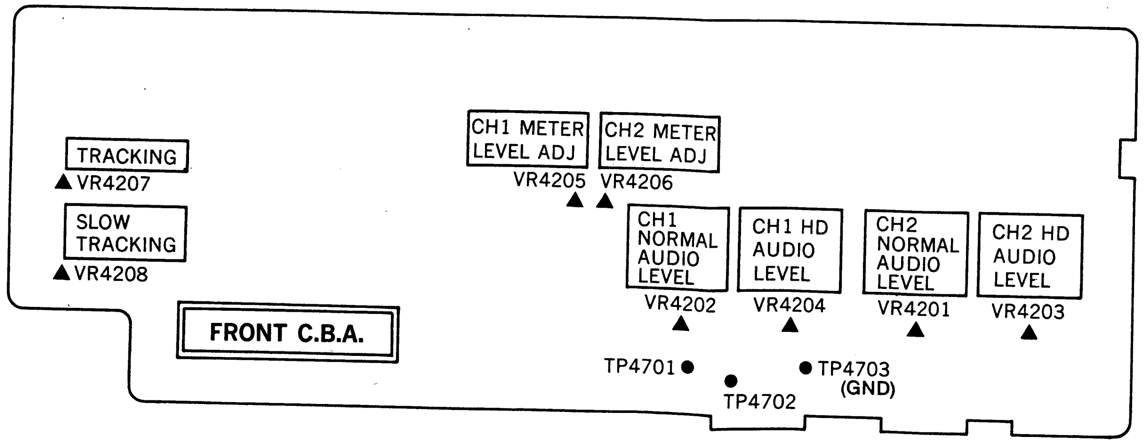

AVR & REEL SERVO C.B.A.
VEP01216B
VIDEO C.B.A.
VEP03385A
FRONT C.B.A.
VEP06338B
MAIN C.B.A.
VEP04177A

AVR & REEL SERVO C.B.A. (VEP01216B)


A.V.R. & REEL SERVO C.B.A.
5V ADJ
R1015
TP1001
TP1002 (GND)

— PARTS SIDE —

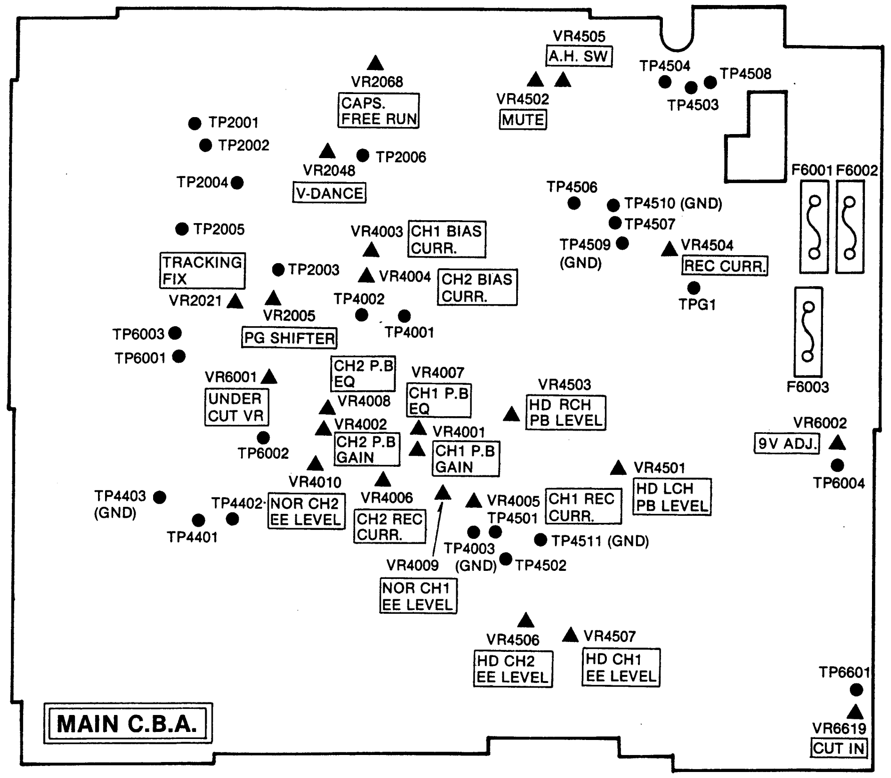
FRONT C.B.A. (VEP06338B)


TRACKING
VR4207
SLOW TRACKING
VR4208
FRONT C.B.A.
CH1 METER LEVEL ADJ
CH2 METER LEVEL ADJ
VR4205
VR4206
CH1 NORMAL AUDIO LEVEL
VR4202
CH1 HD AUDIO LEVEL
VR4204
CH2 NORMAL AUDIO LEVEL
VR4201
CH2 HD AUDIO LEVEL
VR4203
TP4701
TP4702
TP4703 (GND)

— PARTS SIDE —

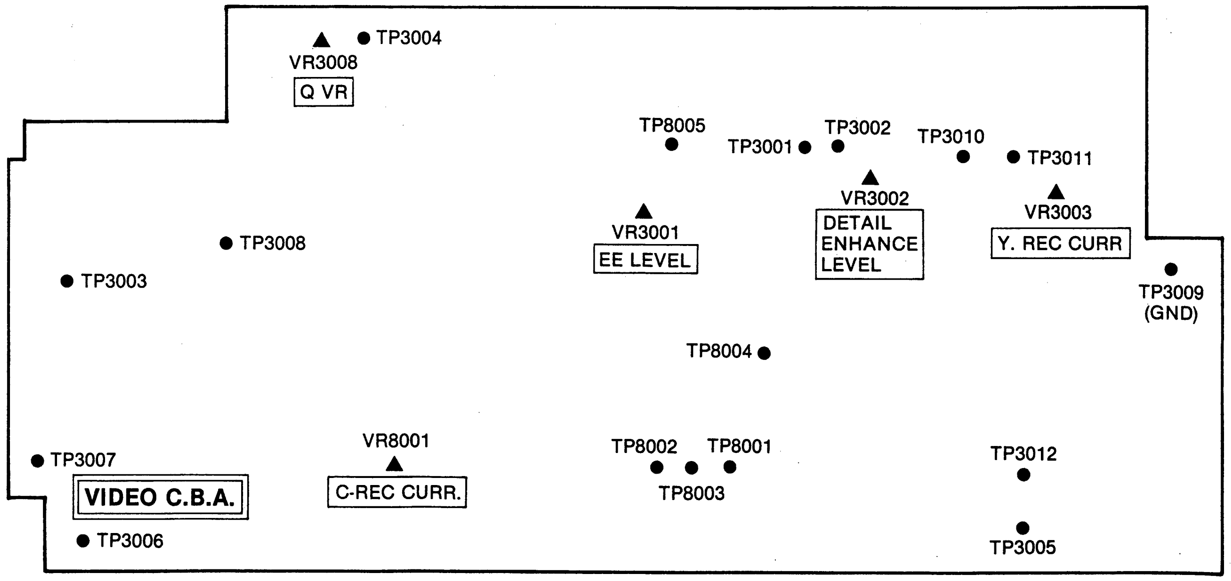
VIDE

MAIN C.B.A. (VEP04177A)


VR4505
A.H. SW
TP4504
TP4508
TP4503
VR4502
MUTE
VR2068
CAPS.
FREE RUN
TP2001
TP2002
VR2048
TP2006
V-DANCE
TP2004
F6001
F6002
TP4506
TP4510 (GND)
TP4507
TP4509
(GND)
VR4504
REC CURR.
TPG1
TP2005
VR4003
CH1 BIAS
CURR.
TRACKING
FIX
TP2003
VR4004
CH2 BIAS
CURR.
VR2021
VR2005
TP4002
TP4001
PG SHIFTER
TP6003
TP6001
CH2 P.B
EQ
VR4007
CH1 P.B
EQ
VR4503
HD RCH
PB LEVEL
VR6001
UNDER
CUT VR
VR4008
F6003
VR4002
CH2 P.B
GAIN
VR4001
CH1 P.B
GAIN
TP6002
VR6002
9V ADJ.
TP6004
VR4010
VR4501
HD LCH
PB LEVEL
TP4403
(GND)
TP4402
NOR CH2
EE LEVEL
VR4006
CH2 REC
CURR.
VR4005
CH1 REC
CURR.
TP4501
TP4401
TP4003
(GND)
TP4511 (GND)
VR4009
TP4502
NOR CH1
EE LEVEL
VR4506
HD CH2
EE LEVEL
VR4507
HD CH1
EE LEVEL
TP6601
VR6619
CUT IN
MAIN C.B.A.

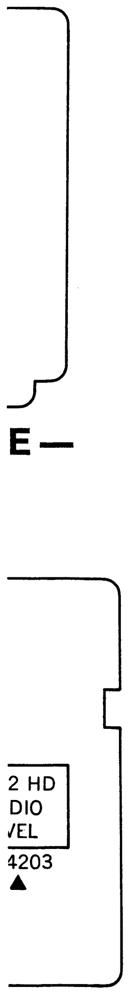
— PARTS SIDE —

VIDEO C.B.A. (VEP03385A)


VR3008
TP3004
Q VR
TP8005
TP3001
TP3002
TP3010
TP3011
VR3002
DETAIL
ENHANCE
LEVEL
VR3001
EE LEVEL
VR3003
Y. REC CURR
TP3008
TP3003
TP3009
(GND)
TP8004
TP3007
VIDEO C.B.A.
VR8001
C-REC CURR.
TP8002
TP8001
TP8003
TP3012
TP3005
TP3006

— PARTS SIDE —

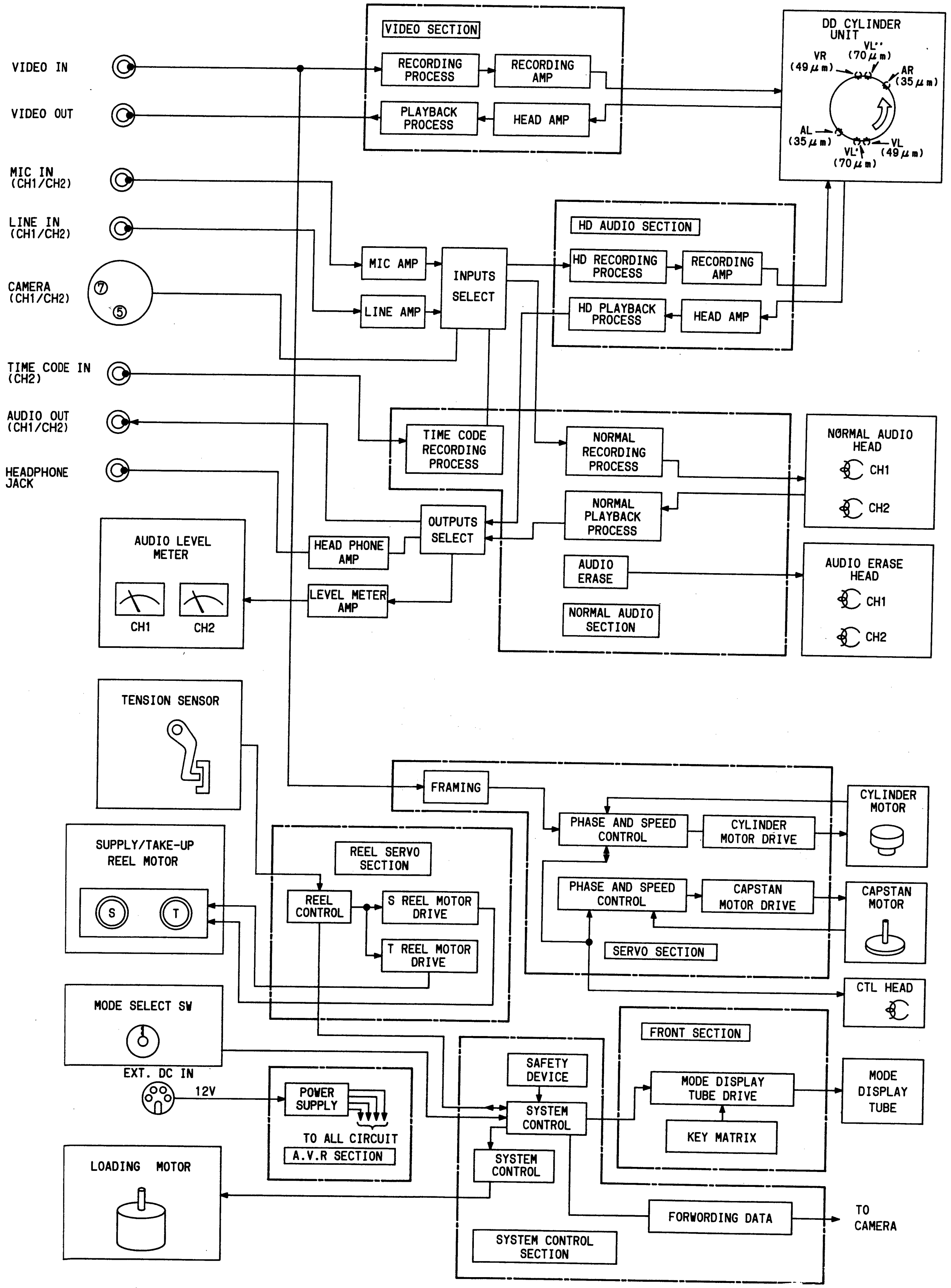
.B.A.
5A


2 HD
DIO
VEL
4203

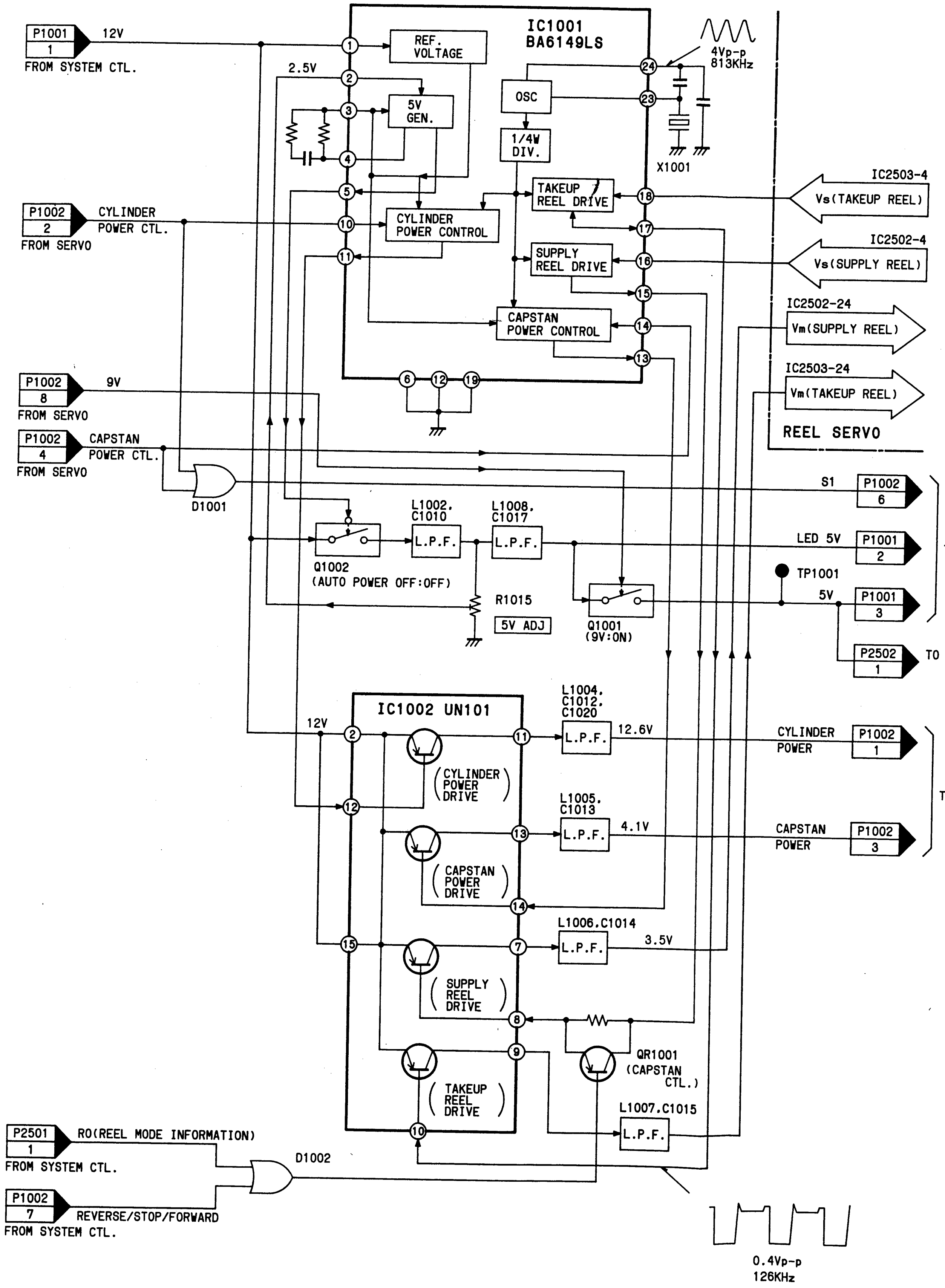
E —

IDE —

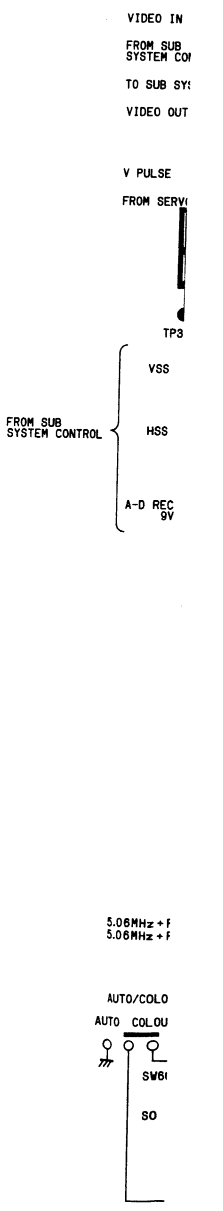
OVERALL BLOCK DIAGRAM


VIDEO IN
VIDEO OUT
MIC IN (CH1/CH2)
LINE IN (CH1/CH2)
CAMERA (CH1/CH2)
⑦
⑤
TIME CODE IN (CH2)
AUDIO OUT (CH1/CH2)
HEADPHONE JACK
VIDEO SECTION
RECORDING PROCESS
RECORDING AMP
PLAYBACK PROCESS
HEAD AMP
DD CYLINDER UNIT
VR (49μm)
VL'' (70μm)
AR (35μm)
AL (35μm)
VL' (70μm)
VL (49μm)
HD AUDIO SECTION
HD RECORDING PROCESS
RECORDING AMP
HD PLAYBACK PROCESS
HEAD AMP
MIC AMP
LINE AMP
INPUTS SELECT
TIME CODE RECORDING PROCESS
NORMAL RECORDING PROCESS
NORMAL PLAYBACK PROCESS
AUDIO ERASE
NORMAL AUDIO SECTION
NORMAL AUDIO HEAD
CH1
CH2
AUDIO ERASE HEAD
CH1
CH2
OUTPUTS SELECT
HEAD PHONE AMP
LEVEL METER AMP
AUDIO LEVEL METER
CH1
CH2
TENSION SENSOR
FRAMING
PHASE AND SPEED CONTROL
CYLINDER MOTOR DRIVE
CYLINDER MOTOR
PHASE AND SPEED CONTROL
CAPSTAN MOTOR DRIVE
CAPSTAN MOTOR
SERVO SECTION
CTL HEAD
SUPPLY/TAKE-UP REEL MOTOR
S
T
REEL SERVO SECTION
REEL CONTROL
S REEL MOTOR DRIVE
T REEL MOTOR DRIVE
MODE SELECT SW
EXT. DC IN
12V
POWER SUPPLY
TO ALL CIRCUIT
A.V.R SECTION
LOADING MOTOR
SAFETY DEVICE
SYSTEM CONTROL
SYSTEM CONTROL
FRONT SECTION
MODE DISPLAY TUBE DRIVE
KEY MATRIX
MODE DISPLAY TUBE
FORWORDING DATA
TO CAMERA
SYSTEM CONTROL SECTION

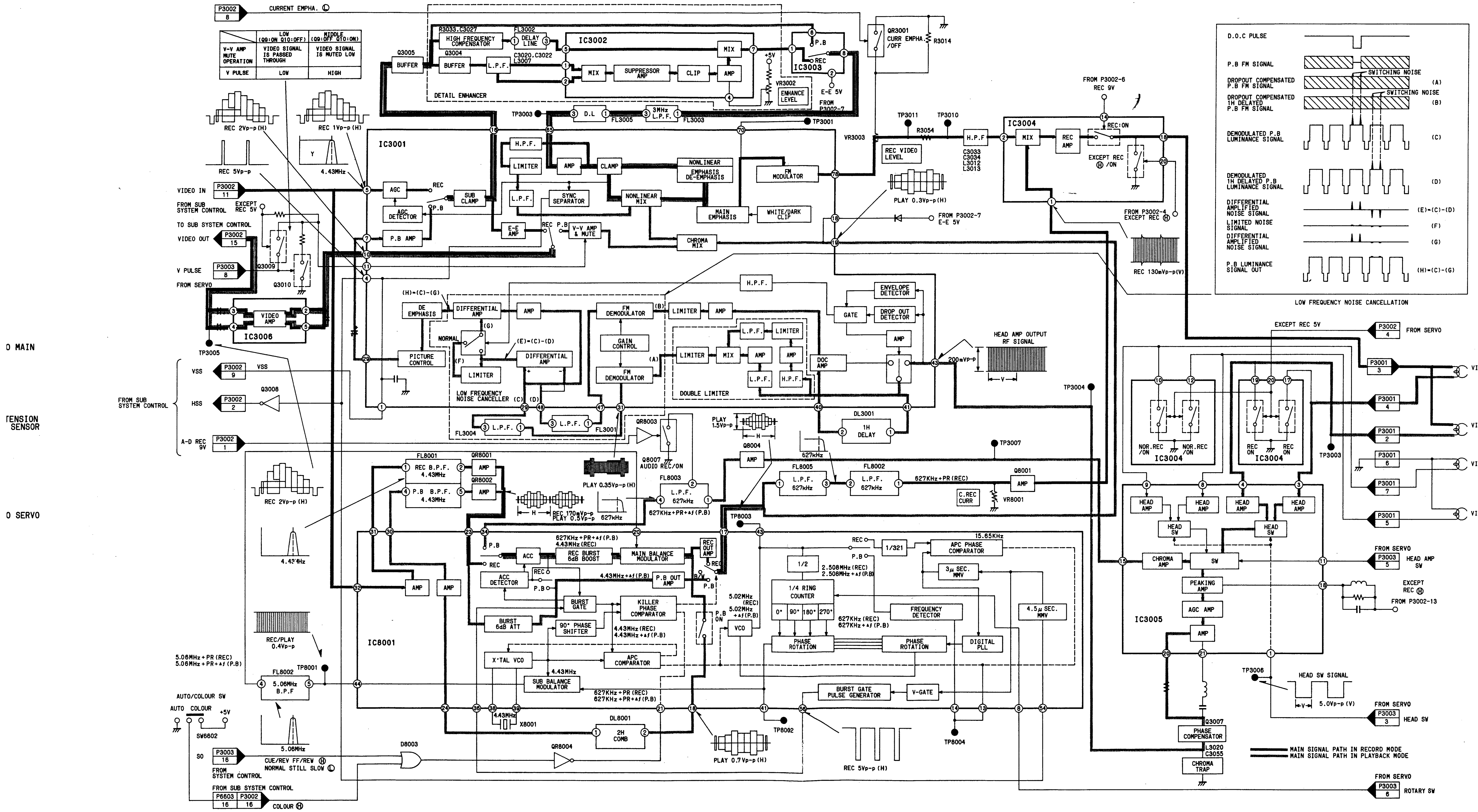
A.V.R BLOCK DIAGRAM


P1001 1
12V
FROM SYSTEM CTL.
IC1001 BA6149LS
REF. VOLTAGE
2.5V
5V GEN.
OSC
1/4W DIV.
4Vp-p 813KHz
X1001
P1002 2
CYLINDER POWER CTL.
FROM SERVO
CYLINDER POWER CONTROL
TAKEUP REEL DRIVE
SUPPLY REEL DRIVE
CAPSTAN POWER CONTROL
IC2503-4
Vs(TAKEUP REEL)
IC2502-4
Vs(SUPPLY REEL)
IC2502-24
Vm(SUPPLY REEL)
IC2503-24
Vm(TAKEUP REEL)
REEL SERVO
P1002 8
9V
FROM SERVO
P1002 4
CAPSTAN POWER CTL.
FROM SERVO
D1001
S1
P1002 6
L1002. C1010
L1008. C1017
L.P.F.
L.P.F.
LED 5V
P1001 2
TO MAIN
Q1002 (AUTO POWER OFF:OFF)
TP1001
R1015
5V ADJ
Q1001 (9V:ON)
5V
P1001 3
P2502 1
TO TENSION SENSOR
IC1002 UN101
12V
(CYLINDER POWER DRIVE)
(CAPSTAN POWER DRIVE)
(SUPPLY REEL DRIVE)
(TAKEUP REEL DRIVE)
L1004. C1012. C1020
12.6V
L.P.F.
CYLINDER POWER
P1002 1
L1005. C1013
4.1V
L.P.F.
CAPSTAN POWER
P1002 3
TO SERVO
L1006.C1014
3.5V
L.P.F.
QR1001 (CAPSTAN CTL.)
L1007.C1015
L.P.F.
P2501 1
RO(REEL MODE INFORMATION)
FROM SYSTEM CTL.
D1002
P1002 7
REVERSE/STOP/FORWARD
FROM SYSTEM CTL.
0.4Vp-p 126KHz

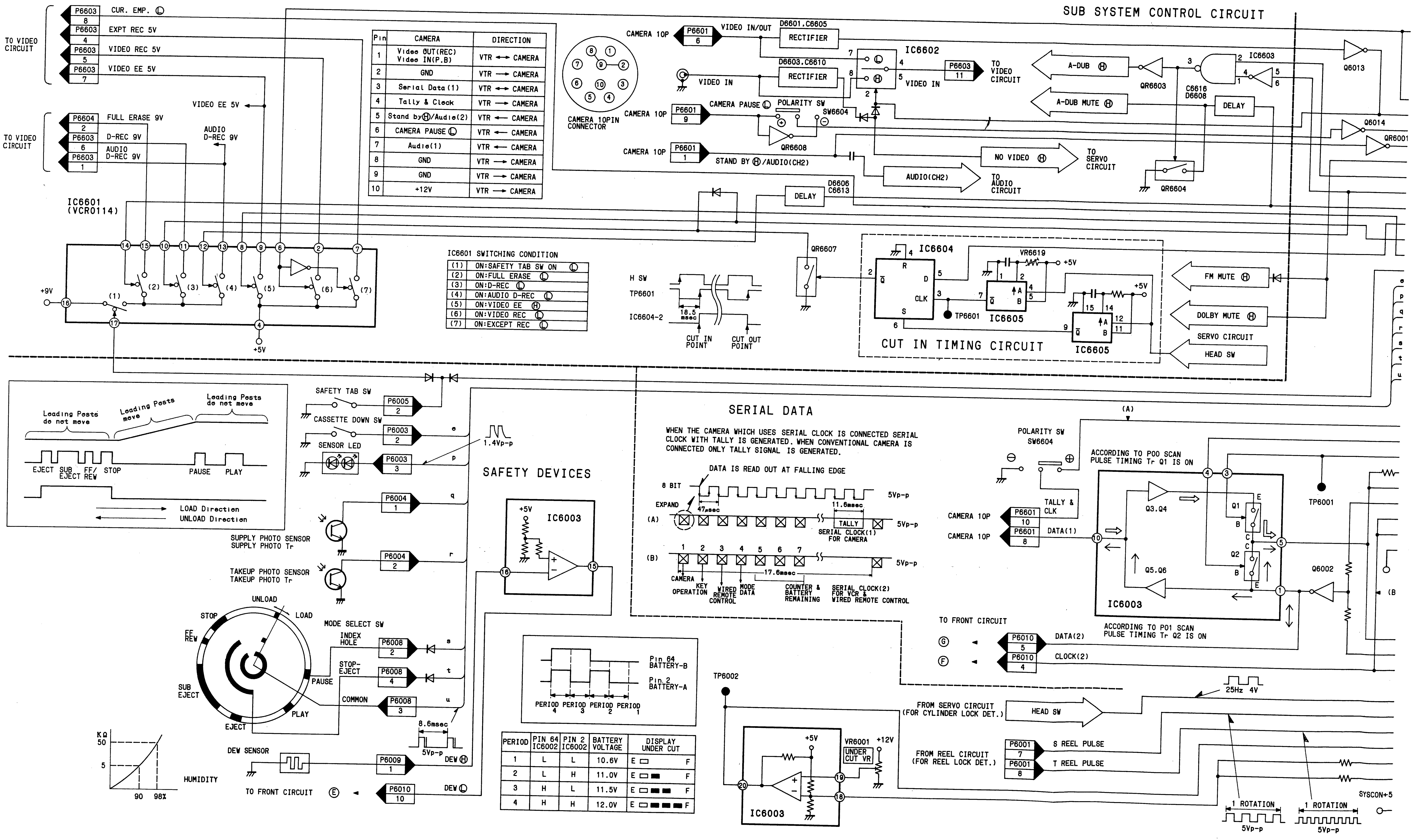
VIDEO B


VIDEO IN
FROM SUB SYSTEM CO
TO SUB SY
VIDEO OUT
V PULSE
FROM SERV
TP3
VSS
FROM SUB SYSTEM CONTROL
HSS
A-D REC 9V
5.06MHz
5.06MHz
AUTO/COLO
AUTO COLOU
SW6
SO

VIDEO BLOCK DIAGRAM


P3002 8 CURRENT EMPHA. Ⓛ
V-V AMP MUTE OPERATION
LOW (Q9:ON Q10:OFF) VIDEO SIGNAL IS PASSED THROUGH
MIDDLE (Q9:OFF Q10:ON) VIDEO SIGNAL IS MUTED LOW
V PULSE LOW HIGH
REC 2Vp-p (H)
REC 1Vp-p (H)
REC 5Vp-p
4.43MHz
VIDEO IN P3002 11
FROM SUB SYSTEM CONTROL EXCEPT REC 5V
TO SUB SYSTEM CONTROL
VIDEO OUT P3002 15
V PULSE P3003 8 FROM SERVO
Q3009 Q3010
IC3006 VIDEO AMP
TP3005
O MAIN
TENSION SENSOR
O SERVO
FROM SUB SYSTEM CONTROL
VSS P3002 9
HSS P3002 2
Q3008
A-D REC 9V P3002 1
Q3005 BUFFER
Q3004 BUFFER
R3033.C3027 HIGH FREQUENCY COMPENSATOR
FL3002 DELAY LINE
IC3002
L.P.F. C3020.C3022 L3007
MIX SUPPRESSOR AMP CLIP AMP
DETAIL ENHANCER
IC3003 P.B REC +5V VR3002 ENHANCE LEVEL E-E 5V FROM P3002-7
QR3001 CURR EMPHA. /OFF R3014
TP3003 D.L FL3005 3MHz L.P.F. FL3003 TP3001
IC3001
AGC AGC DETECTOR SUB CLAMP REC P.B
P.B AMP E-E AMP V-V AMP & MUTE
H.P.F. LIMITER AMP CLAMP L.P.F. SYNC SEPARATOR
NONLINEAR EMPHASIS DE-EMPHASIS NONLINEAR MIX FM MODULATOR
MAIN EMPHASIS WHITE/DARK CLIP CHROMA MIX
TP3011 TP3010 R3054 VR3003 REC VIDEO LEVEL
H.P.F C3033 C3034 L3012 L3013
PLAY 0.3Vp-p (H)
FROM P3002-7 E-E 5V
FROM P3002-6 REC 9V
IC3004 MIX REC AMP REC:ON EXCEPT REC Ⓗ /ON
FROM P3002-4 EXCEPT REC Ⓗ
REC 130mVp-p (V)
D.O.C PULSE
P.B FM SIGNAL
DROPOUT COMPENSATED P.B FM SIGNAL (A)
SWITCHING NOISE
DROPOUT COMPENSATED 1H DELAYED P.B FM SIGNAL (B)
DEMODULATED P.B LUMINANCE SIGNAL (C)
DEMODULATED 1H DELAYED P.B LUMINANCE SIGNAL (D)
DIFFERENTIAL AMPLIFIED NOISE SIGNAL (E)=(C)-(D)
LIMITED NOISE SIGNAL (F)
DIFFERENTIAL AMPLIFIED NOISE SIGNAL (G)
P.B LUMINANCE SIGNAL OUT (H)=(C)-(G)
LOW FREQUENCY NOISE CANCELLATION
(H)=(C)-(G) DE EMPHASIS DIFFERENTIAL AMP AMP
NORMAL (G) (E)=(C)-(D) (F)
PICTURE CONTROL LIMITER DIFFERENTIAL AMP
LOW FREQUENCY NOISE CANCELLER (C) (D)
FL3004 L.P.F. L.P.F. FL3001
FM DEMODULATOR GAIN CONTROL FM DEMODULATOR
(B) LIMITER AMP (A) LIMITER MIX AMP AMP L.P.F. LIMITER L.P.F. H.P.F.
DOUBLE LIMITER DOC AMP
H.P.F. ENVELOPE DETECTOR GATE DROP OUT DETECTOR AMP
200mVp-p
HEAD AMP OUTPUT RF SIGNAL
DL3001 1H DELAY
TP3004 TP3007
QR8003 Q8007 AUDIO REC/ON
PLAY 1.5Vp-p
Q8004 AMP 627kHz
FL8005 L.P.F. 627kHz FL8002 L.P.F. 627kHz 627KHz+PR (REC)
Q8001 AMP C.REC CURR VR8001
FL8001 REC B.P.F. 4.43MHz QR8001 AMP
P.B B.P.F. 4.43MHz QR8002 AMP
PLAY 0.35Vp-p (H)
REC 170mVp-p PLAY 0.5Vp-p 627kHz
FL8003 L.P.F. 627kHz 627KHz+PR+Δf (P.B)
TP8003
REC 2Vp-p (H)
4.43MHz
627KHz+PR+Δf (P.B) 4.43MHz (REC)
P.B REC ACC REC BURST 6dB BOOST MAIN BALANCE MODULATOR REC OUT AMP
ACC DETECTOR 4.43MHz+Δf (P.B) P.B OUT AMP
AMP AMP BURST GATE KILLER PHASE COMPARATOR
BURST 6dB ATT 90° PHASE SHIFTER 4.43MHz (REC) 4.43MHz+Δf (P.B)
X'TAL VCO APC COMPARATOR
SUB BALANCE MODULATOR 4.43MHz
627KHz+PR (REC) 627KHz+PR+Δf (P.B)
IC8001
REC/PLAY 0.4Vp-p
5.06MHz+PR (REC) 5.06MHz+PR+Δf (P.B)
FL8002 5.06MHz B.P.F. TP8001
5.06MHz
AUTO/COLOUR SW AUTO COLOUR +5V SW6602
4.43MHz X8001
DL8001 2H COMB
PLAY 0.7Vp-p (H)
TP8002
REC 1/321 APC PHASE COMPARATOR 15.65KHz
P.B 1/2 2.508MHz (REC) 2.508MHz+Δf (P.B)
3μ SEC. MMV
1/4 RING COUNTER 0° 90° 180° 270°
5.02MHz (REC) 5.02MHz +Δf (P.B)
P.B ON VCO
627KHz (REC) 627KHz+Δf (P.B)
FREQUENCY DETECTOR 4.5μ SEC. MMV
PHASE ROTATION PHASE ROTATION DIGITAL PLL
BURST GATE PULSE GENERATOR V-GATE
TP8004
REC 5Vp-p (H)
D8003 QR8004
SO P3003 16 CUE/REV FF/REW Ⓗ NORMAL STILL SLOW Ⓛ
FROM SYSTEM CONTROL
FROM SUB SYSTEM CONTROL P6603 16 P3002 16 COLOUR Ⓗ
EXCEPT REC 5V P3002 4 FROM SERVO
P3001 3 VIDEO HEAD L
P3001 4
P3001 2 VIDEO HEAD R
P3001 6 VIDEO SS
P3001 7
P3001 5 VIDEO SS
NOR.REC /ON NOR.REC /ON IC3004
REC ON REC ON IC3004
TP3003
HEAD AMP HEAD AMP HEAD AMP HEAD AMP
HEAD SW HEAD SW
CHROMA AMP SW
PEAKING AMP
AGC AMP
AMP
IC3005
FROM SERVO P3003 5 HEAD AMP SW
EXCEPT REC Ⓗ FROM P3002-13
TP3006 HEAD SW SIGNAL 5.0Vp-p (V)
FROM SERVO P3003 3 HEAD SW
Q3007 PHASE COMPENSATOR
L3020 C3055 CHROMA TRAP
MAIN SIGNAL PATH IN RECORD MODE
MAIN SIGNAL PATH IN PLAYBACK MODE
FROM SERVO P3003 6 ROTARY SW

SYSTEM CONTROL BLOCK DIAGRAM


SUB SYSTEM CONTROL CIRCUIT
TO VIDEO CIRCUIT
P6603 8 CUR. EMP. Ⓛ
P6603 4 EXPT REC 5V
P6603 5 VIDEO REC 5V
P6603 7 VIDEO EE 5V
VIDEO EE 5V
P6604 2 FULL ERASE 9V
P6603 6 D-REC 9V
P6603 1 AUDIO D-REC 9V
AUDIO D-REC 9V
IC6601 (VCR0114)
+9V
+5V
CAMERA 10PIN CONNECTOR
CAMERA 10P P6601 6 VIDEO IN/OUT
D6601.C6605 RECTIFIER
D6603.C6610 RECTIFIER
VIDEO IN
IC6602
P6603 11 TO VIDEO CIRCUIT
VIDEO IN
CAMERA 10P P6601 9 CAMERA PAUSE Ⓛ
POLARITY SW SW6604
QR6608
CAMERA 10P P6601 1 STAND BY Ⓗ/AUDIO(CH2)
AUDIO(CH2)
TO AUDIO CIRCUIT
NO VIDEO Ⓗ
TO SERVO CIRCUIT
D6606 C6613 DELAY
A-DUB Ⓗ
A-DUB MUTE Ⓗ
QR6603
C6616 D6608 DELAY
IC6603
Q6013
Q6014
QR6001
QR6604
QR6607
H SW
TP6601
IC6604-2
18.5 msec
CUT IN POINT
CUT OUT POINT
IC6604
VR6619
+5V
TP6601
IC6605
IC6605
CUT IN TIMING CIRCUIT
FM MUTE Ⓗ
DOLBY MUTE Ⓗ
SERVO CIRCUIT
HEAD SW
Leading Posts do not move
Leading Posts move
Leading Posts do not move
EJECT SUB EJECT FF/REW STOP PAUSE PLAY
LOAD Direction
UNLOAD Direction
SAFETY TAB SW P6005 2
CASSETTE DOWN SW P6003 2
SENSOR LED P6003 3
1.4Vp-p
SAFETY DEVICES
P6004 1 SUPPLY PHOTO SENSOR SUPPLY PHOTO Tr
P6004 2 TAKEUP PHOTO SENSOR TAKEUP PHOTO Tr
+5V IC6003
UNLOAD LOAD STOP FF REW SUB EJECT EJECT PAUSE PLAY
MODE SELECT SW
INDEX HOLE P6008 2
STOP-EJECT P6008 4
COMMON P6008 3
8.6msec
5Vp-p
DEW SENSOR P6009 1 DEW Ⓗ
TO FRONT CIRCUIT Ⓔ P6010 10 DEW Ⓛ
KΩ 50 5 90 98% HUMIDITY
Pin 64 BATTERY-B
Pin 2 BATTERY-A
PERIOD 4 PERIOD 3 PERIOD 2 PERIOD 1
(A)
POLARITY SW SW6604
ACCORDING TO P00 SCAN PULSE TIMING Tr Q1 IS ON
CAMERA 10P P6601 10 TALLY & CLK
CAMERA 10P P6601 8 DATA(1)
Q3.Q4 Q1 Q2 Q5.Q6
IC6003
TP6001
Q6002
TO FRONT CIRCUIT
Ⓖ P6010 5 DATA(2)
Ⓕ P6010 4 CLOCK(2)
ACCORDING TO P01 SCAN PULSE TIMING Tr Q2 IS ON
25Hz 4V
TP6002
+5V VR6001 +12V UNDER CUT VR
IC6003
FROM SERVO CIRCUIT (FOR CYLINDER LOCK DET.) HEAD SW
FROM REEL CIRCUIT (FOR REEL LOCK DET.)
P6001 7 S REEL PULSE
P6001 8 T REEL PULSE
1 ROTATION 5Vp-p
1 ROTATION 5Vp-p
SYSCON+5

Pin	CAMERA	DIRECTION
1	Video OUT(REC) Video IN(P.B)	VTR ←→ CAMERA
2	GND	VTR —→ CAMERA
3	Serial Data(1)	VTR ←→ CAMERA
4	Tally & Clock	VTR —→ CAMERA
5	Stand byⒽ/Audio(2)	VTR ←— CAMERA
6	CAMERA PAUSE Ⓛ	VTR ←— CAMERA
7	Audio(1)	VTR ←— CAMERA
8	GND	VTR —→ CAMERA
9	GND	VTR —→ CAMERA
10	+12V	VTR —→ CAMERA

IC6601 SWITCHING CONDITION

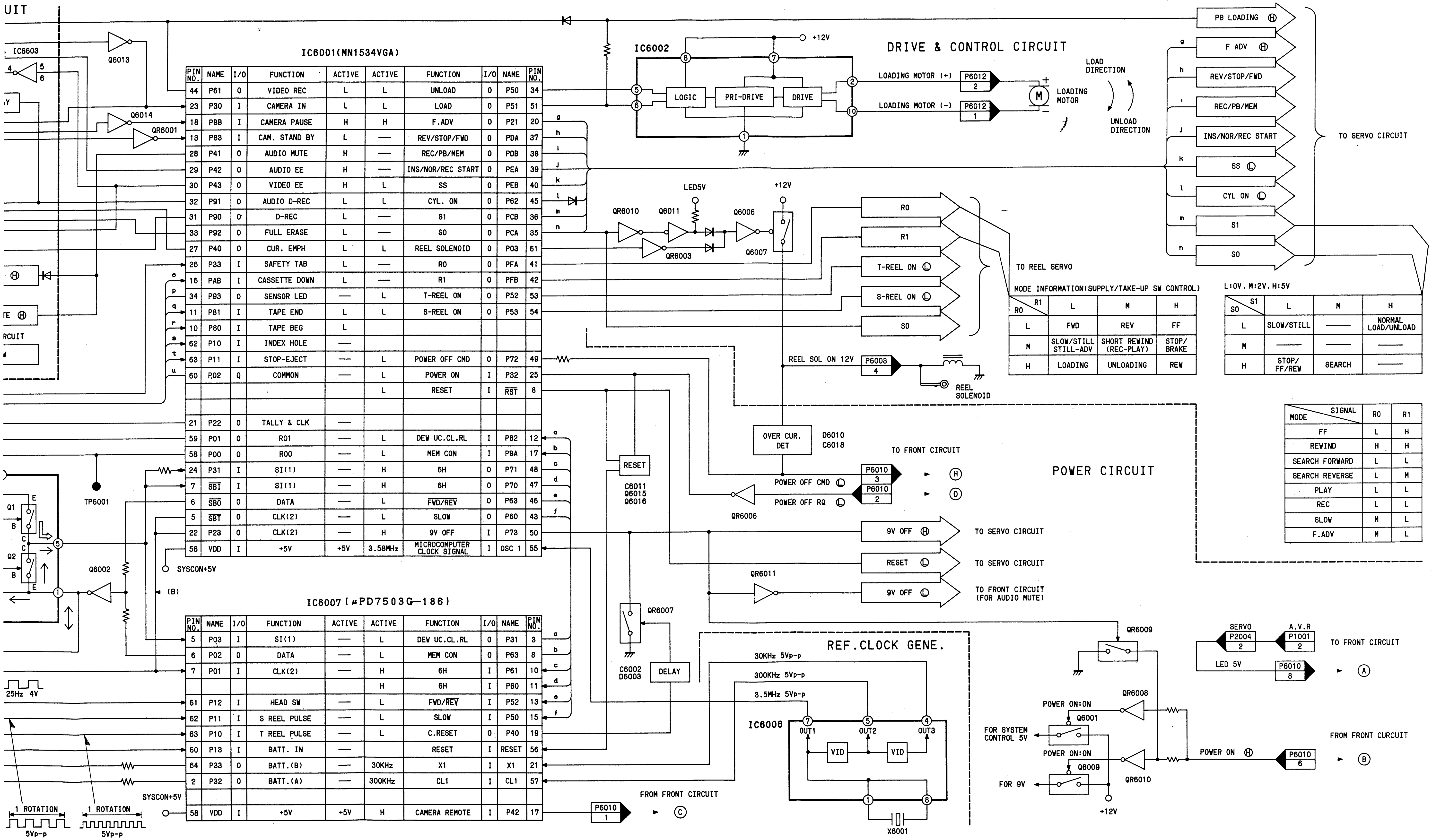
(1)	ON:SAFETY TAB SW ON Ⓛ
(2)	ON:FULL ERASE Ⓛ
(3)	ON:D-REC Ⓛ
(4)	ON:AUDIO D-REC Ⓛ
(5)	ON:VIDEO EE Ⓗ
(6)	ON:VIDEO REC Ⓛ
(7)	ON:EXCEPT REC Ⓛ

SERIAL DATA

WHEN THE CAMERA WHICH USES SERIAL CLOCK IS CONNECTED SERIAL CLOCK WITH TALLY IS GENERATED. WHEN CONVENTIONAL CAMERA IS CONNECTED ONLY TALLY SIGNAL IS GENERATED.

DATA IS READ OUT AT FALLING EDGE
8 BIT
EXPAND
47μsec
11.6msec
5Vp-p
(A)
TALLY
SERIAL CLOCK(1) FOR CAMERA
(B)
1 2 3 4 5 6 7
17.6msec
CAMERA
KEY OPERATION
WIRED REMOTE CONTROL
MODE DATA
COUNTER & BATTERY REMAINING
SERIAL CLOCK(2) FOR VCR & WIRED REMOTE CONTROL

PERIOD	PIN 64 IC6002	PIN 2 IC6002	BATTERY VOLTAGE	DISPLAY UNDER CUT
1	L	L	10.6V	E ▭ F
2	L	H	11.0V	E ▭ ■ F
3	H	L	11.5V	E ▭ ■ ■ F
4	H	H	12.0V	E ▭ ■ ■ ■ F


UIT
IC6603
Q6013
Q6014
QR6001
TP6001
Q1
Q2
Q6002
SYSCON+5V
(B)
25Hz 4V
1 ROTATION
5Vp-p
IC6001(MN1534VGA)
IC6007(μPD7503G-186)
IC6002
+12V
LOGIC
PRI-DRIVE
DRIVE
DRIVE & CONTROL CIRCUIT
LOADING MOTOR (+)
LOADING MOTOR (-)
P6012
LOADING MOTOR
LOAD DIRECTION
UNLOAD DIRECTION
PB LOADING
F ADV
REV/STOP/FWD
REC/PB/MEM
INS/NOR/REC START
SS
CYL ON
S1
S0
TO SERVO CIRCUIT
LED5V
QR6010
Q6011
Q6006
QR6003
Q6007
R0
R1
T-REEL ON
S-REEL ON
TO REEL SERVO
REEL SOL ON 12V
P6003
REEL SOLENOID
OVER CUR. DET
D6010
C6018
TO FRONT CIRCUIT
POWER OFF CMD
POWER OFF RQ
P6010
QR6006
RESET
C6011
Q6015
Q6016
POWER CIRCUIT
9V OFF
TO SERVO CIRCUIT
TO FRONT CIRCUIT (FOR AUDIO MUTE)
QR6011
QR6007
C6002
D6003
DELAY
REF.CLOCK GENE.
30KHz 5Vp-p
300KHz 5Vp-p
3.5MHz 5Vp-p
IC6006
OUT1
OUT2
OUT3
VID
X6001
FROM FRONT CIRCUIT
QR6009
SERVO
P2004
A.V.R
P1001
LED 5V
QR6008
POWER ON:ON
Q6001
Q6009
FOR SYSTEM CONTROL 5V
FOR 9V
QR6010
POWER ON
FROM FRONT CURCUIT

IC6001(MN1534VGA)

PIN NO.	NAME	I/O	FUNCTION	ACTIVE	ACTIVE	FUNCTION	I/O	NAME	PIN NO.
44	P61	0	VIDEO REC	L	L	UNLOAD	0	P50	34
23	P30	I	CAMERA IN	L	L	LOAD	0	P51	51
18	PBB	I	CAMERA PAUSE	H	H	F.ADV	0	P21	20
13	P83	I	CAM. STAND BY	L	—	REV/STOP/FWD	0	PDA	37
28	P41	0	AUDIO MUTE	H	—	REC/PB/MEM	0	PDB	38
29	P42	0	AUDIO EE	H	—	INS/NOR/REC START	0	PEA	39
30	P43	0	VIDEO EE	H	L	SS	0	PEB	40
32	P91	0	AUDIO D-REC	L	L	CYL. ON	0	P62	45
31	P90	0	D-REC	L	—	S1	0	PCB	36
33	P92	0	FULL ERASE	L	—	S0	0	PCA	35
27	P40	0	CUR. EMPH	L	L	REEL SOLENOID	0	P03	61
26	P33	I	SAFETY TAB	L	—	R0	0	PFA	41
16	PAB	I	CASSETTE DOWN	L	—	R1	0	PFB	42
34	P93	0	SENSOR LED	—	L	T-REEL ON	0	P52	53
11	P81	I	TAPE END	L	L	S-REEL ON	0	P53	54
10	P80	I	TAPE BEG	L					
62	P10	I	INDEX HOLE	—					
63	P11	I	STOP-EJECT	—	L	POWER OFF CMD	0	P72	49
60	P02	Q	COMMON	—	L	POWER ON	I	P32	25
					L	RESET	I	$\overline{RST}$	8
21	P22	0	TALLY & CLK	—					
59	P01	0	R01	—	L	DEW UC.CL.RL	I	P82	12
58	P00	0	R00	—	L	MEM CON	I	PBA	17
24	P31	I	SI(1)	—	H	6H	0	P71	48
7	$\overline{SBI}$	I	SI(1)	—	H	6H	0	P70	47
6	$\overline{SBO}$	0	DATA	—	L	$\overline{FWD}$/REV	0	P63	46
5	$\overline{SBT}$	0	CLK(2)	—	L	SLOW	0	P60	43
22	P23	0	CLK(2)	—	H	9V OFF	I	P73	50
56	VDD	I	+5V	+5V	3.58MHz	MICROCOMPUTER CLOCK SIGNAL	I	OSC 1	55

IC6007(μPD7503G-186)

PIN NO.	NAME	I/O	FUNCTION	ACTIVE	ACTIVE	FUNCTION	I/O	NAME	PIN NO.
5	P03	I	SI(1)	—	L	DEW UC.CL.RL	0	P31	3
6	P02	0	DATA	—	L	MEM CON	0	P63	8
7	P01	I	CLK(2)	—	H	6H	I	P61	10
					H	6H	I	P60	11
61	P12	I	HEAD SW	—	L	FWD/$\overline{REV}$	I	P52	13
62	P11	I	S REEL PULSE	—	L	SLOW	I	P50	15
63	P10	I	T REEL PULSE	—	L	C.RESET	0	P40	19
60	P13	I	BATT. IN	—		RESET	I	RESET	56
64	P33	0	BATT.(B)	—	30KHz	X1	I	X1	21
2	P32	0	BATT.(A)	—	300KHz	CL1	I	CL1	57
58	VDD	I	+5V	+5V	H	CAMERA REMOTE	I	P42	17

MODE INFORMATION(SUPPLY/TAKE-UP SW CONTROL)

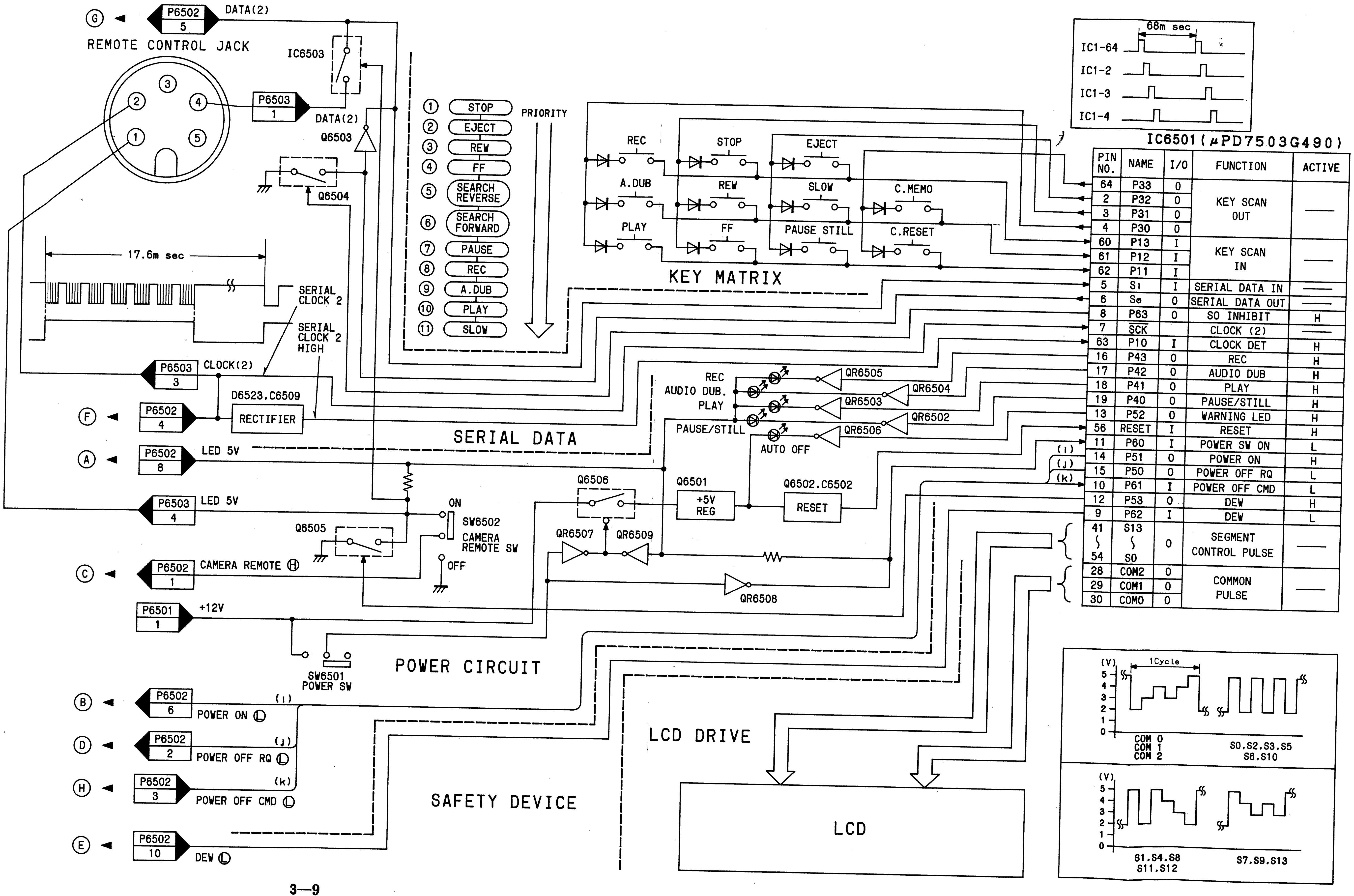
R0 \ R1	L	M	H
L	FWD	REV	FF
M	SLOW/STILL STILL-ADV	SHORT REWIND (REC-PLAY)	STOP/ BRAKE
H	LOADING	UNLOADING	REW

L:0V, M:2V, H:5V

S0 \ S1	L	M	H
L	SLOW/STILL	—	NORMAL LOAD/UNLOAD
M	—	—	—
H	STOP/ FF/REW	SEARCH	—

MODE \ SIGNAL	R0	R1
FF	L	H
REWIND	H	H
SEARCH FORWARD	L	L
SEARCH REVERSE	L	M
PLAY	L	L
REC	L	L
SLOW	M	L
F.ADV	M	L

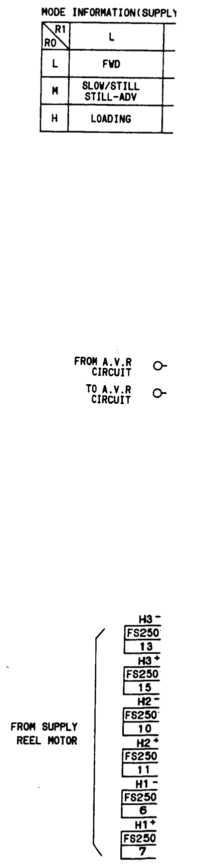
FRONT (SYSTEM CONTROL) BLOCK DIAGRAM


G
P6502 5
DATA(2)
REMOTE CONTROL JACK
IC6503
P6503 1
DATA(2)
Q6503
Q6504
1 2 3 4 5
17.6m sec
SERIAL CLOCK 2
SERIAL CLOCK 2 HIGH
P6503 3
CLOCK(2)
D6523.C6509
F
P6502 4
RECTIFIER
A
P6502 8
LED 5V
P6503 4
LED 5V
Q6505
ON
SW6502 CAMERA REMOTE SW
OFF
C
P6502 1
CAMERA REMOTE Ⓗ
P6501 1
+12V
SW6501 POWER SW
POWER CIRCUIT
B
P6502 6
(i)
POWER ON Ⓛ
D
P6502 2
(j)
POWER OFF RQ Ⓛ
H
P6502 3
(k)
POWER OFF CMD Ⓛ
E
P6502 10
DEW Ⓛ
SAFETY DEVICE
① STOP
② EJECT
③ REW
④ FF
⑤ SEARCH REVERSE
⑥ SEARCH FORWARD
⑦ PAUSE
⑧ REC
⑨ A.DUB
⑩ PLAY
⑪ SLOW
PRIORITY
REC
STOP
EJECT
A.DUB
REW
SLOW
C.MEMO
PLAY
FF
PAUSE STILL
C.RESET
KEY MATRIX
SERIAL DATA
REC
AUDIO DUB.
PLAY
PAUSE/STILL
AUTO OFF
QR6505
QR6504
QR6503
QR6502
QR6506
Q6506
Q6501
+5V REG
Q6502.C6502
RESET
QR6507
QR6509
QR6508
LCD DRIVE
LCD
68m sec
IC1-64
IC1-2
IC1-3
IC1-4
(i)
(j)
(k)
(V)
1Cycle
5
4
3
2
1
0
COM 0
COM 1
COM 2
S0.S2.S3.S5 S6.S10
S1.S4.S8 S11.S12
S7.S9.S13

IC6501 (μPD7503G490)

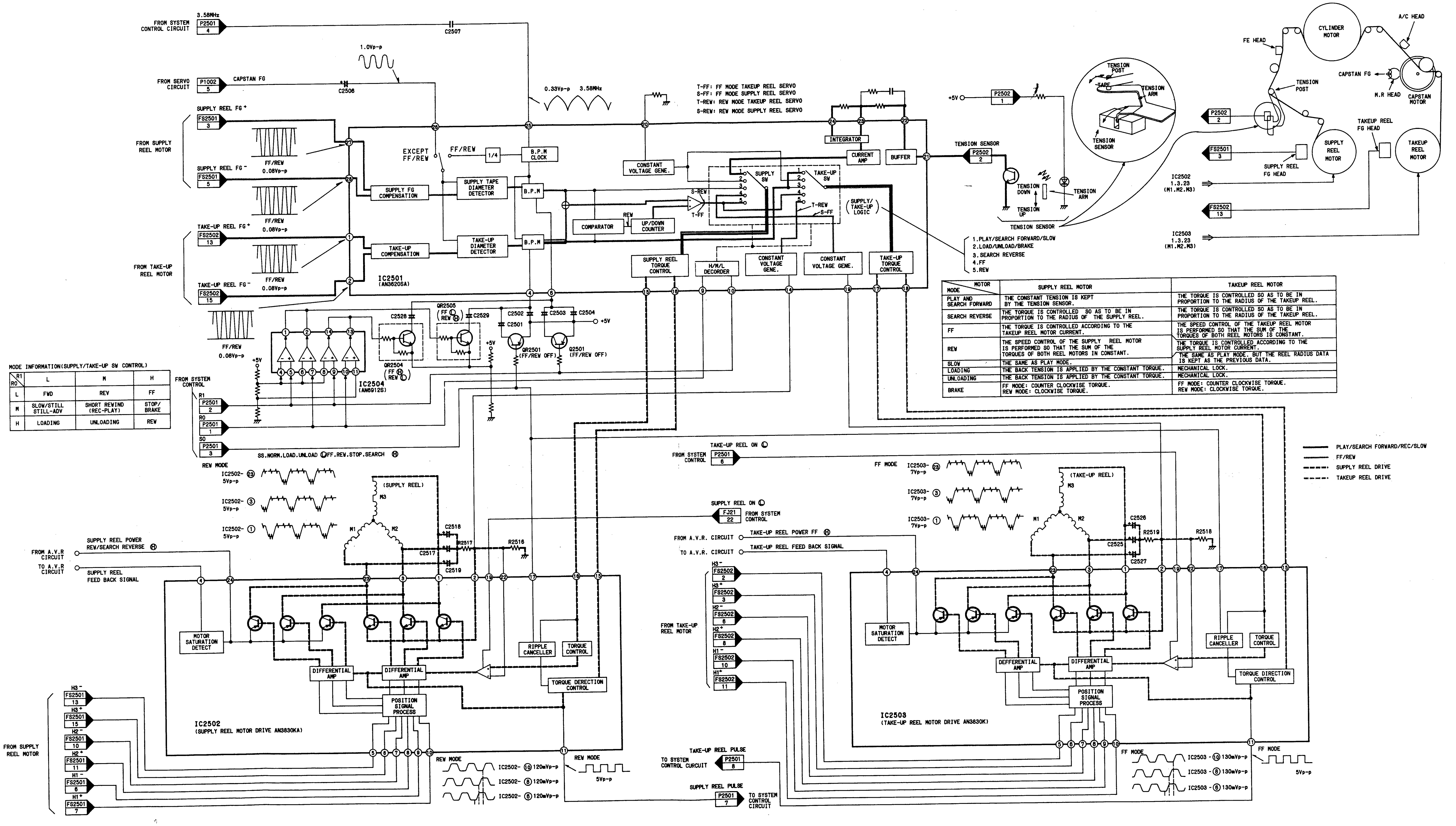
PIN NO.	NAME	I/O	FUNCTION	ACTIVE
64	P33	0	KEY SCAN OUT	—
2	P32	0		
3	P31	0		
4	P30	0		
60	P13	I	KEY SCAN IN	—
61	P12	I		
62	P11	I		
5	SI	I	SERIAL DATA IN	—
6	So	0	SERIAL DATA OUT	—
8	P63	0	SO INHIBIT	H
7	$\overline{SCK}$		CLOCK (2)	—
63	P10	I	CLOCK DET	H
16	P43	0	REC	H
17	P42	0	AUDIO DUB	H
18	P41	0	PLAY	H
19	P40	0	PAUSE/STILL	H
13	P52	0	WARNING LED	H
56	RESET	I	RESET	H
11	P60	I	POWER SW ON	L
14	P51	0	POWER ON	H
15	P50	0	POWER OFF RQ	L
10	P61	I	POWER OFF CMD	L
12	P53	0	DEW	H
9	P62	I	DEW	L
41 ∫ 54	S13 ∫ S0	0	SEGMENT CONTROL PULSE	—
28	COM2	0	COMMON PULSE	—
29	COM1	0		
30	COM0	0		

REEL SI


MODE INFORMATION(SUPPLY
FWD
SLOW/STILL STILL-ADV
LOADING
FROM A.V.R CIRCUIT
TO A.V.R CIRCUIT
FROM SUPPLY REEL MOTOR
FS250

490)
ACTIVE
H
H
H
H
H
H
H
H
L
H
L
L
H
L
;5
3

REEL SERVO BLOCK DIAGRAM

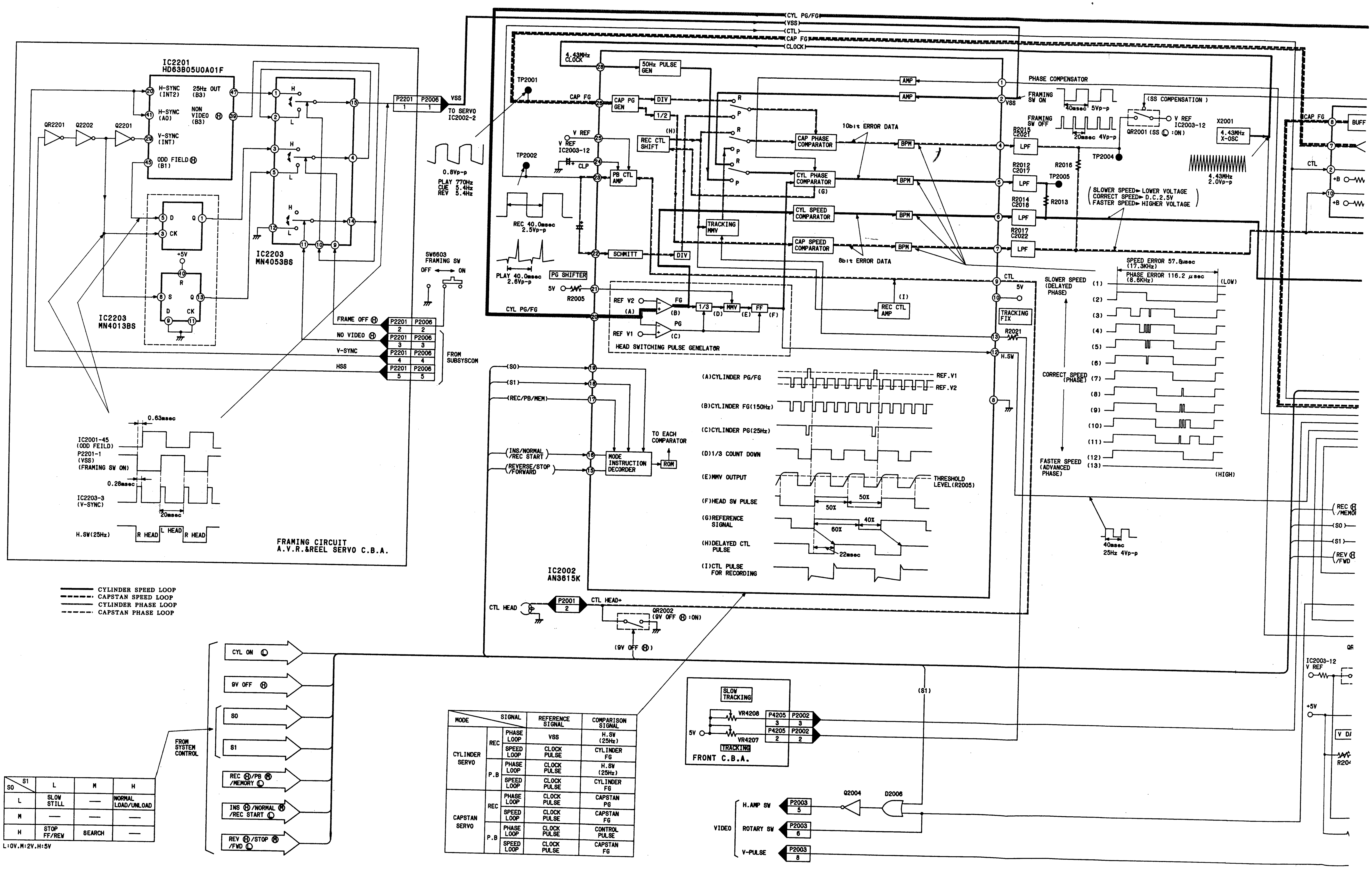

FROM SYSTEM CONTROL CIRCUIT
3.58MHz
P2501 4
C2507
1.0Vp-p
FROM SERVO CIRCUIT
P1002 5
CAPSTAN FG
C2506
0.33Vp-p 3.58MHz
SUPPLY REEL FG+
FS2501 3
FROM SUPPLY REEL MOTOR
SUPPLY REEL FG−
FS2501 5
FF/REW 0.08Vp-p
TAKE-UP REEL FG+
FS2502 13
FROM TAKE-UP REEL MOTOR
TAKE-UP REEL FG−
FS2502 15
EXCEPT FF/REW
FF/REW
1/4
B.P.M CLOCK
SUPPLY FG COMPENSATION
SUPPLY TAPE DIAMETER DETECTOR
B.P.M
TAKE-UP COMPENSATION
TAKE-UP DIAMETER DETECTOR
IC2501 (AN3620SA)
CONSTANT VOLTAGE GENE.
COMPARATOR
REW
UP/DOWN COUNTER
T-FF: FF MODE TAKEUP REEL SERVO
S-FF: FF MODE SUPPLY REEL SERVO
T-REW: REW MODE TAKEUP REEL SERVO
S-REW: REW MODE SUPPLY REEL SERVO
INTEGRATOR
CURRENT AMP
BUFFER
SUPPLY SW
TAKE-UP SW
S-REW
T-FF
T-REW
S-FF
(SUPPLY/ TAKE-UP LOGIC)
SUPPLY REEL TORQUE CONTROL
H/M/L DECORDER
CONSTANT VOLTAGE GENE.
CONSTANT VOLTAGE GENE.
TAKE-UP TORQUE CONTROL
+5V
P2502 1
TENSION SENSOR
P2502 2
TENSION DOWN
TENSION UP
TENSION ARM
TENSION SENSOR
TENSION POST
TAPE
TENSION ARM
TENSION SENSOR
FE HEAD
CYLINDER MOTOR
A/C HEAD
CAPSTAN FG
TENSION POST
M.R HEAD
CAPSTAN MOTOR
P2502 2
TAKEUP REEL FG HEAD
FS2501 3
SUPPLY REEL FG HEAD
SUPPLY REEL MOTOR
TAKEUP REEL MOTOR
IC2502 1.3.23 (M1.M2.M3)
FS2502 13
IC2503 1.3.23 (M1.M2.M3)
1.PLAY/SEARCH FORWARD/SLOW
2.LOAD/UNLOAD/BRAKE
3.SEARCH REVERSE
4.FF
5.REW
QR2505 (FF Ⓗ REW Ⓗ)
C2528
C2529
C2502
C2503
C2504
C2501
QR2504 (FF Ⓗ REW Ⓗ)
QR2501 (FF/REW OFF)
Q2501 (FF/REW OFF)
IC2504 (AN6912S)
FF/REW 0.08Vp-p
FROM SYSTEM CONTROL
R1 P2501 2
R0 P2501 1
S0 P2501 3
SS.NORM.LOAD.UNLOAD Ⓛ FF.REW.STOP.SEARCH Ⓗ
REW MODE
IC2502-㉓ 5Vp-p
IC2502-③ 5Vp-p
IC2502-① 5Vp-p
(SUPPLY REEL)
M1 M2 M3
C2518
R2517
R2516
C2517
C2519
FROM A.V.R CIRCUIT
TO A.V.R CIRCUIT
SUPPLY REEL POWER REW/SEARCH REVERSE Ⓗ
SUPPLY REEL FEED BACK SIGNAL
MOTOR SATURATION DETECT
RIPPLE CANCELLER
TORQUE CONTROL
DIFFERENTIAL AMP
DIFFERENTIAL AMP
TORQUE DERECTION CONTROL
POSITION SIGNAL PROCESS
IC2502 (SUPPLY REEL MOTOR DRIVE AN3830KA)
FROM SUPPLY REEL MOTOR
H3− FS2501 13
H3+ FS2501 15
H2− FS2501 10
H2+ FS2501 11
H1− FS2501 6
H1+ FS2501 7
REW MODE
IC2502-⑩ 120mVp-p
IC2502-⑧ 120mVp-p
IC2502-⑥ 120mVp-p
REW MODE 5Vp-p
FROM SYSTEM CONTROL
TAKE-UP REEL ON Ⓛ
P2501 6
SUPPLY REEL ON Ⓛ
FJ21 22
FROM SYSTEM CONTROL
FROM A.V.R. CIRCUIT
TAKE-UP REEL POWER FF Ⓗ
TO A.V.R. CIRCUIT
TAKE-UP REEL FEED BACK SIGNAL
FROM TAKE-UP REEL MOTOR
H3− FS2502 2
H3+ FS2502 3
H2− FS2502 6
H2+ FS2502 8
H1− FS2502 10
H1+ FS2502 11
FF MODE
IC2503-㉓ 7Vp-p
IC2503-③ 7Vp-p
IC2503-① 7Vp-p
(TAKE-UP REEL)
C2526
R2519
R2518
C2525
C2527
MOTOR SATURATION DETECT
RIPPLE CANCELLER
TORQUE CONTROL
DEFFERENTIAL AMP
DIFFERENTIAL AMP
TORQUE DIRECTION CONTROL
POSITION SIGNAL PROCESS
IC2503 (TAKE-UP REEL MOTOR DRIVE AN3830K)
TAKE-UP REEL PULSE
TO SYSTEM CONTROL CURCUIT
P2501 8
SUPPLY REEL PULSE
P2501 7
TO SYSTEM CONTROL CIRCUIT
FF MODE
IC2503-⑩ 130mVp-p
IC2503-⑧ 130mVp-p
IC2503-⑥ 130mVp-p
FF MODE 5Vp-p
PLAY/SEARCH FORWARD/REC/SLOW
FF/REW
SUPPLY REEL DRIVE
TAKEUP REEL DRIVE

MODE INFORMATION(SUPPLY/TAKE-UP SW CONTROL)

R1 / RO	L	M	H
L	FWD	REV	FF
M	SLOW/STILL STILL-ADV	SHORT REWIND (REC-PLAY)	STOP/ BRAKE
H	LOADING	UNLOADING	REW

MOTOR / MODE	SUPPLY REEL MOTOR	TAKEUP REEL MOTOR
PLAY AND SEARCH FORWARD	THE CONSTANT TENSION IS KEPT BY THE TENSION SENSOR.	THE TORQUE IS CONTROLLED SO AS TO BE IN PROPORTION TO THE RADIUS OF THE TAKEUP REEL.
SEARCH REVERSE	THE TORQUE IS CONTROLLED SO AS TO BE IN PROPORTION TO THE RADIUS OF THE SUPPLY REEL.	THE TORQUE IS CONTROLLED SO AS TO BE IN PROPORTION TO THE RADIUS OF THE TAKEUP REEL.
FF	THE TORQUE IS CONTROLLED ACCORDING TO THE TAKEUP REEL MOTOR CURRENT.	THE SPEED CONTROL OF THE TAKEUP REEL MOTOR IS PERFORMED SO THAT THE SUM OF THE TORQUES OF BOTH REEL MOTORS IS CONSTANT.
REW	THE SPEED CONTROL OF THE SUPPLY REEL MOTOR IS PERFORMED SO THAT THE SUM OF THE TORQUES OF BOTH REEL MOTORS IN CONSTANT.	THE TORQUE IS CONTROLLED ACCORDING TO THE SUPPLY REEL MOTOR CURRENT.
SLOW	THE SAME AS PLAY MODE.	THE SAME AS PLAY MODE. BUT THE REEL RADIUS DATA IS KEPT AS THE PREVIOUS DATA.
LOADING	THE BACK TENSION IS APPLIED BY THE CONSTANT TORQUE.	MECHANICAL LOCK.
UNLOADING	THE BACK TENSION IS APPLIED BY THE CONSTANT TORQUE.	MECHANICAL LOCK.
BRAKE	FF MODE: COUNTER CLOCKWISE TORQUE. REW MODE: CLOCKWISE TORQUE.	FF MODE: COUNTER CLOCKWISE TORQUE. REW MODE: CLOCKWISE TORQUE.

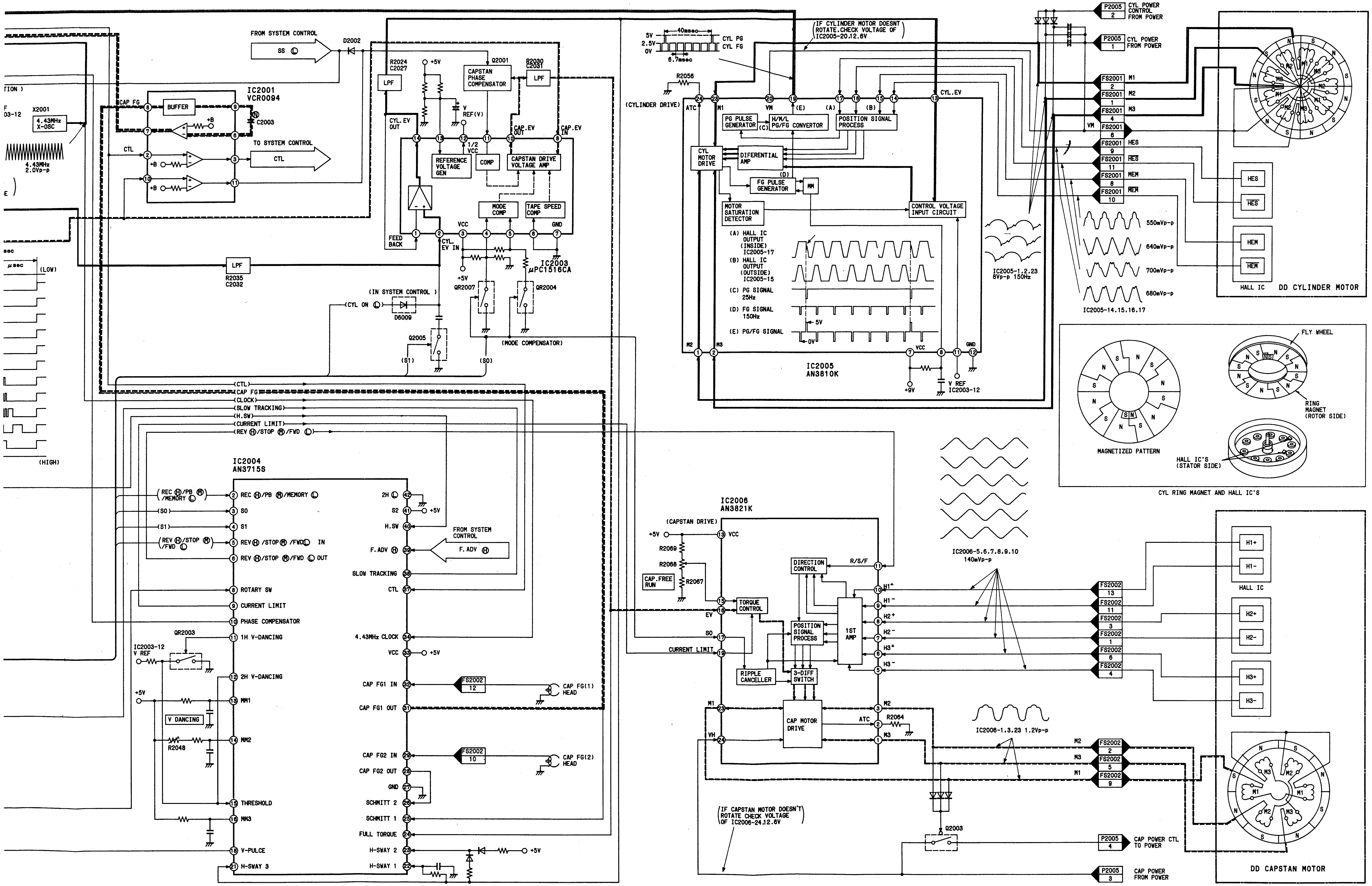
SERVO BLOCK DIAGRAM


IC2201
HD63B05U0A01F
H-SYNC (INT2)
25Hz OUT (B3)
H-SYNC (A0)
NON VIDEO Ⓗ (B3)
V-SYNC (INT)
ODD FIELD Ⓗ (B1)
QR2201
Q2202
Q2201
IC2203
MN4053BS
IC2203
MN4013BS
+5V
P2201
P2006
VSS
TO SERVO IC2002-2
0.8Vp-p
PLAY 770Hz
CUE 5.4Hz
REV 5.4Hz
SW6603 FRAMING SW
OFF ON
FRAME OFF Ⓗ
NO VIDEO Ⓗ
V-SYNC
HSS
FROM SUBSYSCOM
0.63msec
IC2001-45 (ODD FEILD)
P2201-1 (VSS) (FRAMING SW ON)
0.28msec
IC2203-3 (V-SYNC)
20msec
H.SW(25Hz)
R HEAD
L HEAD
R HEAD
FRAMING CIRCUIT
A.V.R.&REEL SERVO C.B.A.
CYLINDER SPEED LOOP
CAPSTAN SPEED LOOP
CYLINDER PHASE LOOP
CAPSTAN PHASE LOOP
CYL PG/FG
VSS
CTL
CAP FG
CLOCK
4.43MHz CLOCK
50Hz PULSE GEN
TP2001
CAP FG
CAP PG GEN
DIV
1/2
V REF
V REF IC2003-12
CLP
PB CTL AMP
REC CTL SHIFT
TP2002
REC 40.0msec 2.5Vp-p
PLAY 40.0msec 2.8Vp-p
SCHMITT
DIV
PG SHIFTER
5V
R2005
CYL PG/FG
REF V2
REF V1
FG
PG
1/3
MMV
FF
(A) (B) (C) (D) (E) (F)
HEAD SWITCHING PULSE GENELATOR
CAP PHASE COMPARATOR
CYL PHASE COMPARATOR
CYL SPEED COMPARATOR
CAP SPEED COMPARATOR
TRACKING MMV
10bit ERROR DATA
8bit ERROR DATA
BPM
AMP
REC CTL AMP
(G) (H) (I)
R P
PHASE COMPENSATOR
FRAMING SW ON
40msec 5Vp-p
FRAMING SW OFF
20msec 4Vp-p
R2015 C2021
R2012 C2017
R2014 C2018
R2017 C2022
LPF
R2016
TP2004
TP2005
R2013
(SS COMPENSATION)
QR2001 (SS Ⓛ :ON)
V REF IC2003-12
X2001
4.43MHz X-OSC
4.43MHz 2.0Vp-p
SLOWER SPEED→ LOWER VOLTAGE
CORRECT SPEED→ D.C.2.5V
FASTER SPEED→ HIGHER VOLTAGE
CTL
5V
TRACKING FIX
R2021
H.SW
SPEED ERROR 57.8µsec (17.3KHz)
PHASE ERROR 116.2 µsec (8.6KHz)
SLOWER SPEED (DELAYED PHASE)
CORRECT SPEED (PHASE)
FASTER SPEED (ADVANCED PHASE)
(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13)
(LOW)
(HIGH)
40msec 25Hz 4Vp-p
(S0)
(S1)
(REC/PB/MEM)
(INS/NORMAL /REC START)
(REVERSE/STOP /FORWARD)
MODE INSTRUCTION DECORDER
ROM
TO EACH COMPARATOR
(A)CYLINDER PG/FG
REF.V1
REF.V2
(B)CYLINDER FG(150Hz)
(C)CYLINDER PG(25Hz)
(D)1/3 COUNT DOWN
(E)MMV OUTPUT
THRESHOLD LEVEL(R2005)
(F)HEAD SW PULSE
50%
50%
(G)REFERENCE SIGNAL
60%
40%
(H)DELAYED CTL PULSE
22msec
(I)CTL PULSE FOR RECORDING
IC2002
AN3615K
CTL HEAD
P2001 2
CTL HEAD+
QR2002 (9V OFF Ⓗ :ON)
(9V OFF Ⓗ)
CYL ON Ⓛ
9V OFF Ⓗ
S0
S1
REC Ⓗ/PB Ⓜ /MEMORY Ⓛ
INS Ⓗ/NORMAL Ⓜ /REC START Ⓛ
REV Ⓗ/STOP Ⓜ /FWD Ⓛ
FROM SYSTEM CONTROL
SLOW TRACKING
VR4208
VR4207
TRACKING
5V
P4205 P2002 3 3
P4205 P2002 2 2
FRONT C.B.A.
(S1)
Q2004
D2006
H.AMP SW
ROTARY SW
V-PULSE
VIDEO
P2003 5
P2003 6
P2003 8
CAP FG
BUFF
CTL
+B
REC Ⓗ /MEMO
(S0)
(S1)
REV Ⓗ /FWD
IC2003-12 V REF
+5V
V D
R20
QR

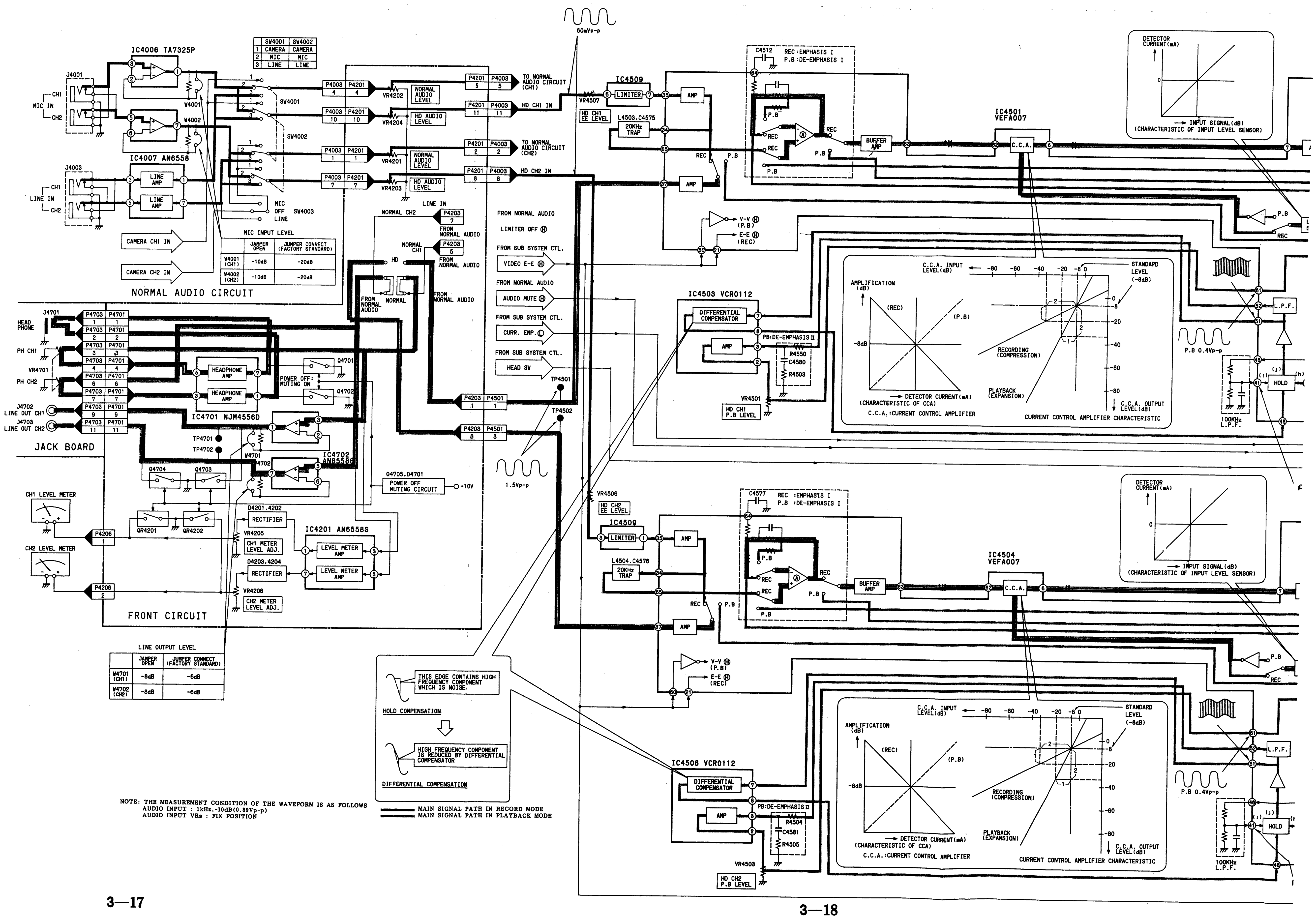
MODE \ SIGNAL			REFERENCE SIGNAL	COMPARISON SIGNAL
CYLINDER SERVO	REC	PHASE LOOP	VSS	H.SW (25Hz)
		SPEED LOOP	CLOCK PULSE	CYLINDER FG
	P.B	PHASE LOOP	CLOCK PULSE	H.SW (25Hz)
		SPEED LOOP	CLOCK PULSE	CYLINDER FG
CAPSTAN SERVO	REC	PHASE LOOP	CLOCK PULSE	CAPSTAN PG
		SPEED LOOP	CLOCK PULSE	CAPSTAN FG
	P.B	PHASE LOOP	CLOCK PULSE	CONTROL PULSE
		SPEED LOOP	CLOCK PULSE	CAPSTAN FG

S0 \ S1	L	M	H
L	SLOW STILL	—	NORMAL LOAD/UNLOAD
M	—	—	—
H	STOP FF/REW	SEARCH	—

L:0V.M:2V.H:5V


FROM SYSTEM CONTROL
SS Ⓛ
D2002
IC2001
VCR0094
CAP FG
BUFFER
C2003
TO SYSTEM CONTROL
CTL
X2001
4.43MHz X-OSC
4.43MHz 2.0Vp-p
(LOW)
(HIGH)
LPF
R2035 C2032
R2024 C2027
+5V
CAPSTAN PHASE COMPENSATOR
Q2001
R2030 C2031
LPF
V REF(V)
CYL.EV OUT
CAP.EV OUT
CAP.EV IN
REFERENCE VOLTAGE GEN
1/2 VCC
COMP
CAPSTAN DRIVE VOLTAGE AMP
MODE COMP
TAPE SPEED COMP
VCC
GND
FEED BACK
CYL. EV IN
IC2003
µPC1516CA
QR2007
QR2004
(IN SYSTEM CONTROL)
(CYL ON Ⓛ)
D6009
Q2005
(S1)
(S0)
(MODE COMPENSATOR)
(CTL)
(CAP FG)
(CLOCK)
(SLOW TRACKING)
(H.SW)
(CURRENT LIMIT)
(REV Ⓗ/STOP Ⓜ/FWD Ⓛ)
IC2004
AN3715S
(REC Ⓗ/PB Ⓜ /MEMORY Ⓛ)
REC Ⓗ/PB Ⓜ/MEMORY Ⓛ
SO
S1
(REV Ⓗ/STOP Ⓜ /FWD Ⓛ)
REV Ⓗ /STOP Ⓜ /FWD Ⓛ IN
REV Ⓗ /STOP Ⓜ /FWD Ⓛ OUT
ROTARY SW
CURRENT LIMIT
PHASE COMPENSATOR
1H V-DANCING
QR2003
IC2003-12 V REF
2H V-DANCING
MM1
V DANCING
MM2
R2048
THRESHOLD
MM3
V-PULCE
H-SWAY 3
2H Ⓛ
S2
H.SW
FROM SYSTEM CONTROL
F.ADV Ⓗ
SLOW TRACKING
CTL
4.43MHz CLOCK
VCC
CAP FG1 IN
FS2002 12
CAP FG(1) HEAD
CAP FG1 OUT
CAP FG2 IN
FS2002 10
CAP FG(2) HEAD
CAP FG2 OUT
GND
SCHMITT 2
SCHMITT 1
FULL TORQUE
H-SWAY 2
H-SWAY 1
5V 2.5V 0V
40msec
6.7msec
CYL PG
CYL FG
(IF CYLINDER MOTOR DOESNT ROTATE.CHECK VOLTAGE OF IC2005-20.12.6V)
R2056
(CYLINDER DRIVE)
ATC
M1
VM
(E)
(A)
(B)
CYL.EV
PG PULSE GENERATOR
(C)
H/M/L PG/FG CONVERTOR
POSITION SIGNAL PROCESS
CYL MOTOR DRIVE
DIFERENTIAL AMP
(D)
FG PULSE GENERATOR
MM
MOTOR SATURATION DETECTOR
CONTROL VOLTAGE INPUT CIRCUIT
(A) HALL IC OUTPUT (INSIDE) IC2005-17
(B) HALL IC OUTPUT (OUTSIDE) IC2005-15
(C) PG SIGNAL 25Hz
(D) FG SIGNAL 150Hz
(E) PG/FG SIGNAL
5V
0V
M2
M3
VCC
GND
IC2005
AN3810K
+9V
V REF IC2003-12
P2005 2 CYL POWER CONTROL FROM POWER
P2005 1 CYL POWER FROM POWER
FS2001 M1
FS2001 2 M2
FS2001 1 M3
FS2001 4 VM
FS2001 6 HES
FS2001 9 HES
FS2001 11 HEM
FS2001 8 HEM
FS2001 10
IC2005-1.2.23 8Vp-p 150Hz
550mVp-p
640mVp-p
700mVp-p
680mVp-p
IC2005-14.15.16.17
HES
HES
HEM
HEM
HALL IC
DD CYLINDER MOTOR
FLY WHEEL
MAGNETIZED PATTERN
RING MAGNET (ROTOR SIDE)
HALL IC'S (STATOR SIDE)
CYL RING MAGNET AND HALL IC'S
IC2006
AN3821K
(CAPSTAN DRIVE)
+5V
R2069
R2068
CAP.FREE RUN
R2067
VCC
DIRECTION CONTROL
R/S/F
TORQUE CONTROL
EV
SO
CURRENT LIMIT
POSITION SIGNAL PROCESS
1ST AMP
RIPPLE CANCELLER
3-DIFF SWITCH
H1+
H1-
H2+
H2-
H3+
H3-
CAP MOTOR DRIVE
ATC
R2064
M1
M2
M3
VH
IC2006-5.6.7.8.9.10 140mVp-p
FS2002 13
FS2002 11
FS2002 3
FS2002 1
FS2002 6
FS2002 4
HALL IC
IC2006-1.3.23 1.2Vp-p
FS2002 2
FS2002 5
FS2002 9
(IF CAPSTAN MOTOR DOESN'T ROTATE CHECK VOLTAGE OF IC2006-24.12.6V)
Q2003
P2005 4 CAP POWER CTL TO POWER
P2005 3 CAP POWER FROM POWER
DD CAPSTAN MOTOR

HD AUDIO BLOCK DIAGRAM


IC4006 TA7325P
IC4007 AN6558
J4001
MIC IN
CH1
CH2
J4003
LINE IN
W4001
W4002
SW4001
SW4002
SW4003
MIC
OFF
LINE
LINE AMP
CAMERA CH1 IN
CAMERA CH2 IN
NORMAL AUDIO CIRCUIT
P4003
P4201
VR4202
VR4204
VR4201
VR4203
NORMAL AUDIO LEVEL
HD AUDIO LEVEL
TO NORMAL AUDIO CIRCUIT (CH1)
HD CH1 IN
TO NORMAL AUDIO CIRCUIT (CH2)
HD CH2 IN
60mVp-p
LINE IN
NORMAL CH2
NORMAL CH1
P4203
FROM NORMAL AUDIO
HD
NORMAL
FROM NORMAL AUDIO
LIMITER OFF Ⓗ
FROM SUB SYSTEM CTL.
VIDEO E-E Ⓗ
AUDIO MUTE Ⓗ
CURR. EMP. Ⓛ
HEAD SW
TP4501
TP4502
P4501
1.5Vp-p
J4701
HEAD PHONE
PH CH1
VR4701
PH CH2
J4702 LINE OUT CH1
J4703 LINE OUT CH2
P4703
P4701
HEADPHONE AMP
IC4701 NJM4556D
POWER OFF: MUTING ON
Q4701
Q4702
TP4701
TP4702
W4701
W4702
IC4702 AN6558S
Q4704
Q4703
Q4705.D4701
POWER OFF MUTING CIRCUIT
+10V
JACK BOARD
CH1 LEVEL METER
CH2 LEVEL METER
P4206
QR4201
QR4202
D4201.4202
RECTIFIER
VR4205
CH1 METER LEVEL ADJ.
IC4201 AN6558S
LEVEL METER AMP
D4203.4204
VR4206
CH2 METER LEVEL ADJ.
FRONT CIRCUIT
IC4509
LIMITER
VR4507
HD CH1 EE LEVEL
L4503.C4575
20KHz TRAP
AMP
C4512
REC : EMPHASIS I
P.B : DE-EMPHASIS I
REC
P.B
BUFFER AMP
IC4501 VEFA007
C.C.A.
V-V Ⓗ (P.B)
E-E Ⓗ (REC)
IC4503 VCR0112
DIFFERENTIAL COMPENSATOR
PB: DE-EMPHASIS II
R4550
C4580
R4503
VR4501
HD CH1 P.B LEVEL
DETECTOR CURRENT (mA)
INPUT SIGNAL (dB)
(CHARACTERISTIC OF INPUT LEVEL SENSOR)
C.C.A. INPUT LEVEL (dB)
AMPLIFICATION (dB)
(REC)
(P.B)
-8dB
→ DETECTOR CURRENT (mA)
(CHARACTERISTIC OF CCA)
C.C.A. : CURRENT CONTROL AMPLIFIER
STANDARD LEVEL (-8dB)
RECORDING (COMPRESSION)
PLAYBACK (EXPANSION)
C.C.A. OUTPUT LEVEL (dB)
CURRENT CONTROL AMPLIFIER CHARACTERISTIC
-80 -60 -40 -20 -8 0
0 -8 -20 -40 -60 -80
L.P.F.
P.B 0.4Vp-p
HOLD
100KHz L.P.F.
VR4506
HD CH2 EE LEVEL
L4504.C4576
C4577
IC4504 VEFA007
IC4506 VCR0112
R4504
C4581
R4505
VR4503
HD CH2 P.B LEVEL
THIS EDGE CONTAINS HIGH FREQUENCY COMPONENT WHICH IS NOISE.
HOLD COMPENSATION
HIGH FREQUENCY COMPONENT IS REDUCED BY DIFFERENTIAL COMPENSATOR
DIFFERENTIAL COMPENSATION

	SW4001	SW4002
1	CAMERA	CAMERA
2	MIC	MIC
3	LINE	LINE

MIC INPUT LEVEL

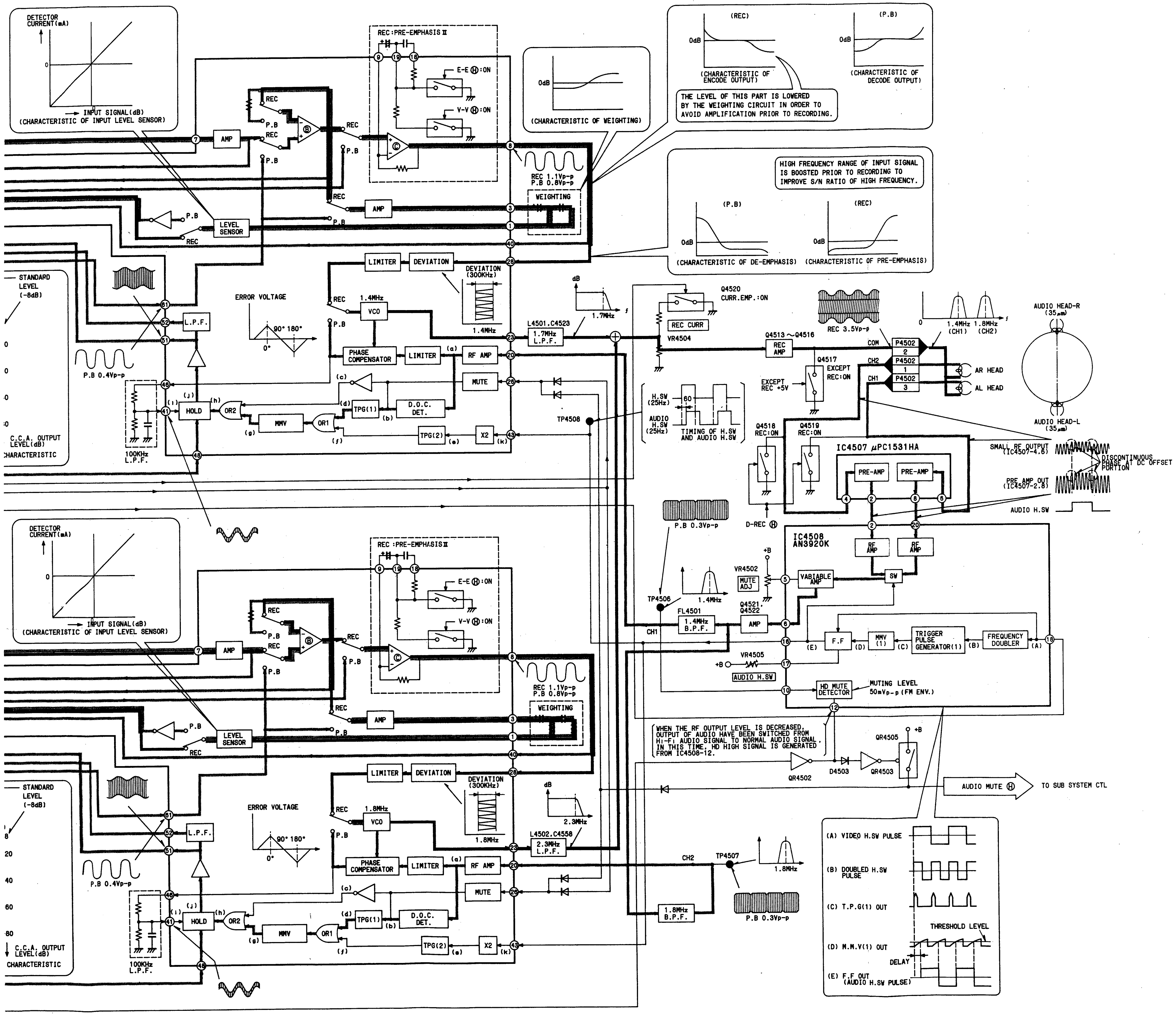
	JUMPER OPEN	JUMPER CONNECT (FACTORY STANDARD)
W4001 (CH1)	-10dB	-20dB
W4002 (CH2)	-10dB	-20dB

LINE OUTPUT LEVEL

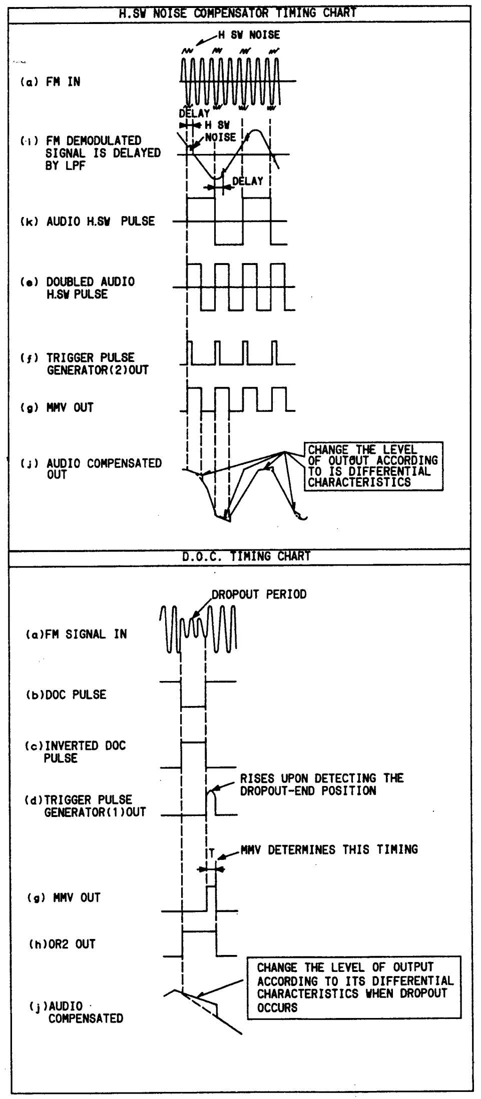
	JUMPER OPEN	JUMPER CONNECT (FACTORY STANDARD)
W4701 (CH1)	-8dB	-6dB
W4702 (CH2)	-8dB	-6dB

NOTE: THE MEASUREMENT CONDITION OF THE WAVEFORM IS AS FOLLOWS
AUDIO INPUT : 1kHz,-10dB(0.89Vp-p)
AUDIO INPUT VRs : FIX POSITION

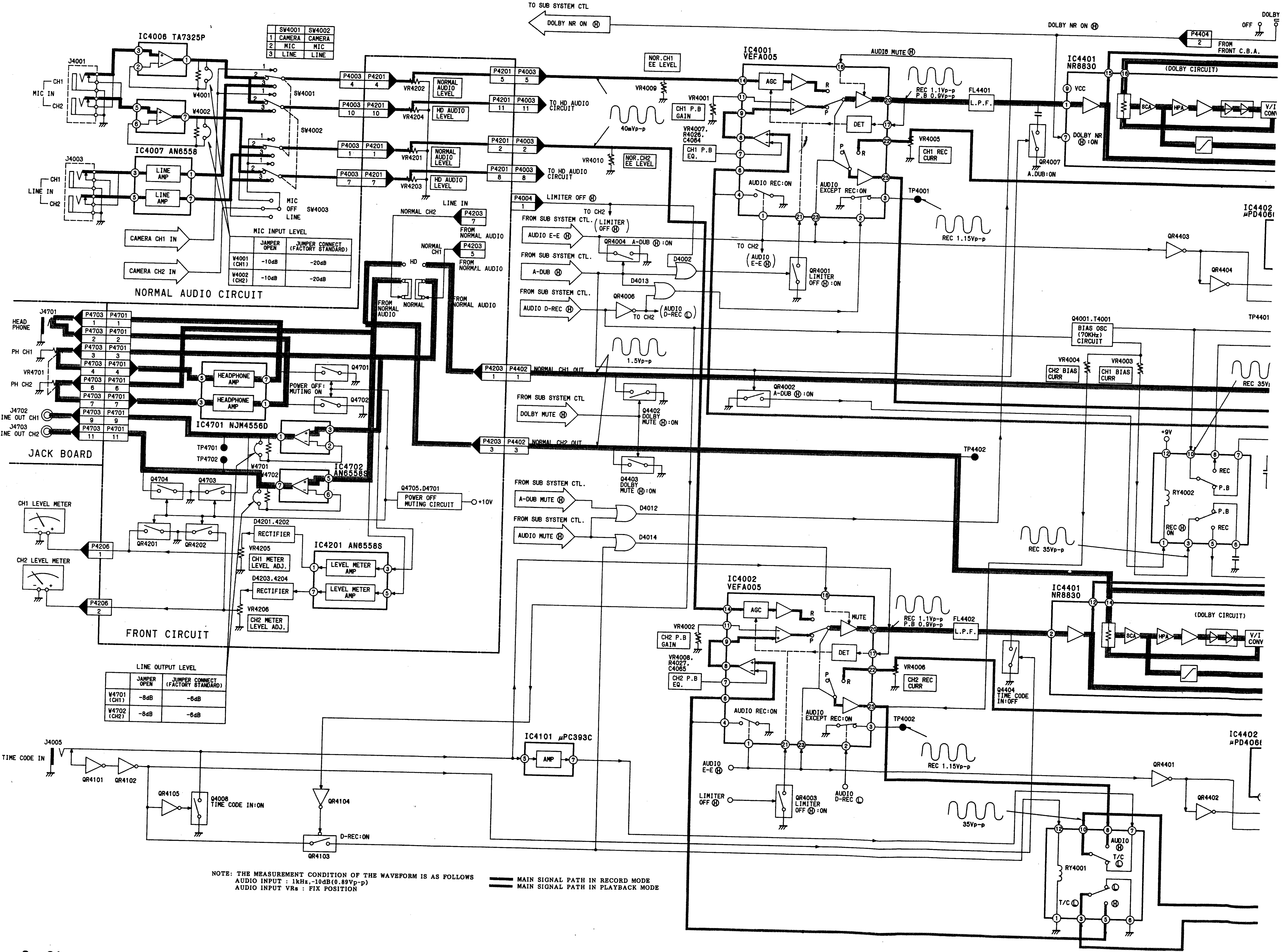
MAIN SIGNAL PATH IN RECORD MODE
MAIN SIGNAL PATH IN PLAYBACK MODE


DETECTOR CURRENT(mA)
INPUT SIGNAL(dB)
(CHARACTERISTIC OF INPUT LEVEL SENSOR)
REC:PRE-EMPHASIS II
E-E Ⓗ:ON
V-V Ⓗ:ON
REC
P.B
AMP
LEVEL SENSOR
0dB
(CHARACTERISTIC OF WEIGHTING)
(REC)
(P.B)
(CHARACTERISTIC OF ENCODE OUTPUT)
(CHARACTERISTIC OF DECODE OUTPUT)
THE LEVEL OF THIS PART IS LOWERED BY THE WEIGHTING CIRCUIT IN ORDER TO AVOID AMPLIFICATION PRIOR TO RECORDING.
HIGH FREQUENCY RANGE OF INPUT SIGNAL IS BOOSTED PRIOR TO RECORDING TO IMPROVE S/N RATIO OF HIGH FREQUENCY.
(CHARACTERISTIC OF DE-EMPHASIS)
(CHARACTERISTIC OF PRE-EMPHASIS)
REC 1.1Vp-p
P.B 0.8Vp-p
WEIGHTING
LIMITER
DEVIATION
DEVIATION (300KHz)
1.4MHz
STANDARD LEVEL (-8dB)
ERROR VOLTAGE
90° 180°
0°
1.4MHz
VCO
L.P.F.
PHASE COMPENSATOR
LIMITER
RF AMP
MUTE
P.B 0.4Vp-p
HOLD
OR2
MMV
OR1
TPG(1)
D.O.C. DET.
TPG(2)
X2
100KHz L.P.F.
C.C.A. OUTPUT LEVEL(dB)
CHARACTERISTIC
TP4508
L4501,C4523
1.7MHz L.P.F.
1.7MHz
dB
f
Q4520
CURR.EMP.:ON
REC CURR
VR4504
Q4513～Q4516
REC AMP
REC 3.5Vp-p
COM
CH2
CH1
P4502
Q4517
EXCEPT REC:ON
EXCEPT REC +5V
1.4MHz (CH1)
1.8MHz (CH2)
AUDIO HEAD-R (35μm)
AR HEAD
AL HEAD
AUDIO HEAD-L (35μm)
H.SW (25Hz)
AUDIO H.SW (25Hz)
60
TIMING OF H.SW AND AUDIO H.SW
Q4518 REC:ON
Q4519 REC:ON
IC4507 μPC1531HA
PRE-AMP
PRE-AMP
SMALL RF OUTPUT (IC4507-4.5)
PRE AMP OUT (IC4507-2.8)
DISCONTINUOUS PHASE AT DC OFFSET PORTION
AUDIO H.SW
D-REC Ⓗ
P.B 0.3Vp-p
IC4508 AN3920K
RF AMP
SW
+B
VR4502
MUTE ADJ
VARIABLE AMP
TP4506
1.4MHz
FL4501
1.4MHz B.P.F.
Q4521, Q4522
AMP
CH1
F.F
MMV (1)
TRIGGER PULSE GENERATOR(1)
FREQUENCY DOUBLER
(A) (B) (C) (D) (E)
VR4505
+B
AUDIO H.SW
HD MUTE DETECTOR
MUTING LEVEL 50mVp-p (FM ENV.)
WHEN THE RF OUTPUT LEVEL IS DECREASED, OUTPUT OF AUDIO HAVE BEEN SWITCHED FROM Hi-F; AUDIO SIGNAL TO NORMAL AUDIO SIGNAL. IN THIS TIME, HD HIGH SIGNAL IS GENERATED FROM IC4508-12.
QR4505
QR4502
D4503
QR4503
AUDIO MUTE Ⓗ
TO SUB SYSTEM CTL
1.8MHz
2.3MHz
L4502,C4558
2.3MHz L.P.F.
CH2
TP4507
1.8MHz
1.8MHz B.P.F.
(A) VIDEO H.SW PULSE
(B) DOUBLED H.SW PULSE
(C) T.P.G(1) OUT
(D) M.M.V(1) OUT
THRESHOLD LEVEL
DELAY
(E) F.F OUT (AUDIO H.SW PULSE)

IC4501/4504 TIMING CHART


H.SW NOISE COMPENSATOR TIMING CHART
H SW NOISE
(a) FM IN
DELAY
H SW NOISE
(i) FM DEMODULATED SIGNAL IS DELAYED BY LPF
DELAY
(k) AUDIO H.SW PULSE
(e) DOUBLED AUDIO H.SW PULSE
(f) TRIGGER PULSE GENERATOR(2)OUT
(g) MMV OUT
(j) AUDIO COMPENSATED OUT
CHANGE THE LEVEL OF OUTPUT ACCORDING TO IS DIFFERENTIAL CHARACTERISTICS
D.O.C. TIMING CHART
DROPOUT PERIOD
(a)FM SIGNAL IN
(b)DOC PULSE
(c)INVERTED DOC PULSE
(d)TRIGGER PULSE GENERATOR(1)OUT
RISES UPON DETECTING THE DROPOUT-END POSITION
T
MMV DETERMINES THIS TIMING
(g) MMV OUT
(h)OR2 OUT
(j)AUDIO COMPENSATED
CHANGE THE LEVEL OF OUTPUT ACCORDING TO ITS DIFFERENTIAL CHARACTERISTICS WHEN DROPOUT OCCURS

NORMAL AUDIO BLOCK DIAGRAM


TO SUB SYSTEM CTL
DOLBY NR ON Ⓗ
IC4006 TA7325P
IC4007 AN6558
J4001
MIC IN
CH1
CH2
J4003
LINE IN
LINE AMP
W4001
W4002
SW4001
SW4002
MIC
OFF
LINE
SW4003
CAMERA CH1 IN
CAMERA CH2 IN
NORMAL AUDIO CIRCUIT
P4003
P4201
VR4202
VR4204
VR4201
VR4203
NORMAL AUDIO LEVEL
HD AUDIO LEVEL
TO HD AUDIO CIRCUIT
NOR.CH1 EE LEVEL
NOR.CH2 EE LEVEL
VR4009
VR4010
40mVp-p
LIMITER OFF Ⓗ
FROM SUB SYSTEM CTL.
AUDIO E-E Ⓗ
A-DUB Ⓗ
AUDIO D-REC Ⓗ
QR4004 A-DUB Ⓗ:ON
D4002
D4013
QR4006
TO CH2
NORMAL CH1
NORMAL CH2
LINE IN
FROM NORMAL AUDIO
HD
NORMAL
J4701
HEAD PHONE
PH CH1
PH CH2
VR4701
J4702 LINE OUT CH1
J4703 LINE OUT CH2
P4703
P4701
JACK BOARD
HEADPHONE AMP
IC4701 NJM4556D
Q4701
Q4702
POWER OFF: MUTING ON
IC4702 AN6558S
TP4701
TP4702
W4701
W4702
Q4704
Q4703
Q4705.D4701
POWER OFF MUTING CIRCUIT
+10V
CH1 LEVEL METER
CH2 LEVEL METER
P4206
QR4201
QR4202
D4201.4202
RECTIFIER
VR4205
CH1 METER LEVEL ADJ.
D4203.4204
VR4206
CH2 METER LEVEL ADJ.
IC4201 AN6558S
LEVEL METER AMP
FRONT CIRCUIT
P4203
P4402
NORMAL CH1 OUT
NORMAL CH2 OUT
1.5Vp-p
DOLBY MUTE Ⓗ
Q4402 DOLBY MUTE Ⓗ:ON
Q4403 DOLBY MUTE Ⓗ:ON
A-DUB MUTE Ⓗ
AUDIO MUTE Ⓗ
D4012
D4014
IC4001 VEFA005
IC4002 VEFA005
AGC
DET
MUTE
AUDIO MUTE Ⓗ
VR4001
CH1 P.B GAIN
VR4007, R4026, C4064
CH1 P.B EQ.
VR4002
CH2 P.B GAIN
VR4008, R4027, C4065
CH2 P.B EQ.
AUDIO REC:ON
AUDIO EXCEPT REC:ON
QR4001 LIMITER OFF Ⓗ:ON
QR4003 LIMITER OFF Ⓗ:ON
AUDIO E-E Ⓗ
LIMITER OFF Ⓗ
AUDIO D-REC Ⓛ
QR4002 A-DUB Ⓗ:ON
REC 1.1Vp-p
P.B 0.9Vp-p
FL4401
FL4402
L.P.F.
VR4005
CH1 REC CURR
VR4006
CH2 REC CURR
TP4001
TP4002
TP4402
REC 1.15Vp-p
IC4401 NR8830
VCC
DOLBY NR Ⓗ:ON
QR4007 A.DUB:ON
Q4404 TIME CODE IN:OFF
(DOLBY CIRCUIT)
SCA
HPA
V/I CONV
P4404
FROM FRONT C.B.A.
DOLBY
OFF
IC4402 µPD4066
QR4403
QR4404
QR4401
QR4402
TP4401
Q4001.T4001
BIAS OSC (70KHz) CIRCUIT
VR4004
CH2 BIAS CURR
VR4003
CH1 BIAS CURR
REC 35Vp-p
35Vp-p
+9V
RY4002
RY4001
REC
P.B
REC Ⓗ ON
AUDIO Ⓗ
T/C Ⓛ
J4005
TIME CODE IN
QR4101
QR4102
QR4105
Q4006 TIME CODE IN:ON
QR4104
QR4103
D-REC:ON
IC4101 µPC393C
AMP

	SW4001	SW4002
1	CAMERA	CAMERA
2	MIC	MIC
3	LINE	LINE

MIC INPUT LEVEL

	JAMPER OPEN	JUMPER CONNECT (FACTORY STANDARD)
W4001 (CH1)	-10dB	-20dB
W4002 (CH2)	-10dB	-20dB

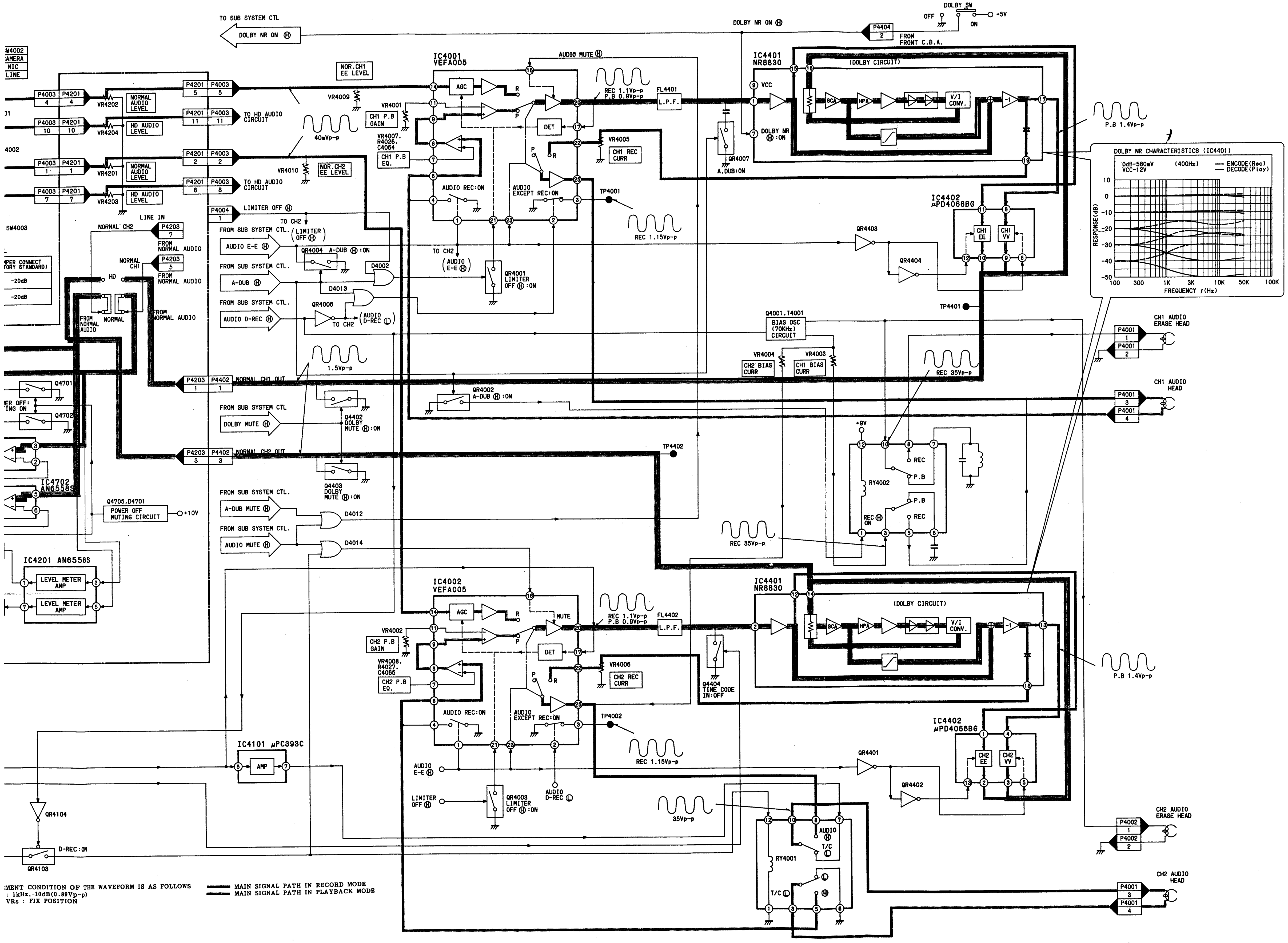
LINE OUTPUT LEVEL

	JAMPER OPEN	JUMPER CONNECT (FACTORY STANDARD)
W4701 (CH1)	-8dB	-6dB
W4702 (CH2)	-8dB	-6dB

NOTE: THE MEASUREMENT CONDITION OF THE WAVEFORM IS AS FOLLOWS
AUDIO INPUT : 1kHz,-10dB(0.89Vp-p)
AUDIO INPUT VRs : FIX POSITION

▬ MAIN SIGNAL PATH IN RECORD MODE
▨ MAIN SIGNAL PATH IN PLAYBACK MODE

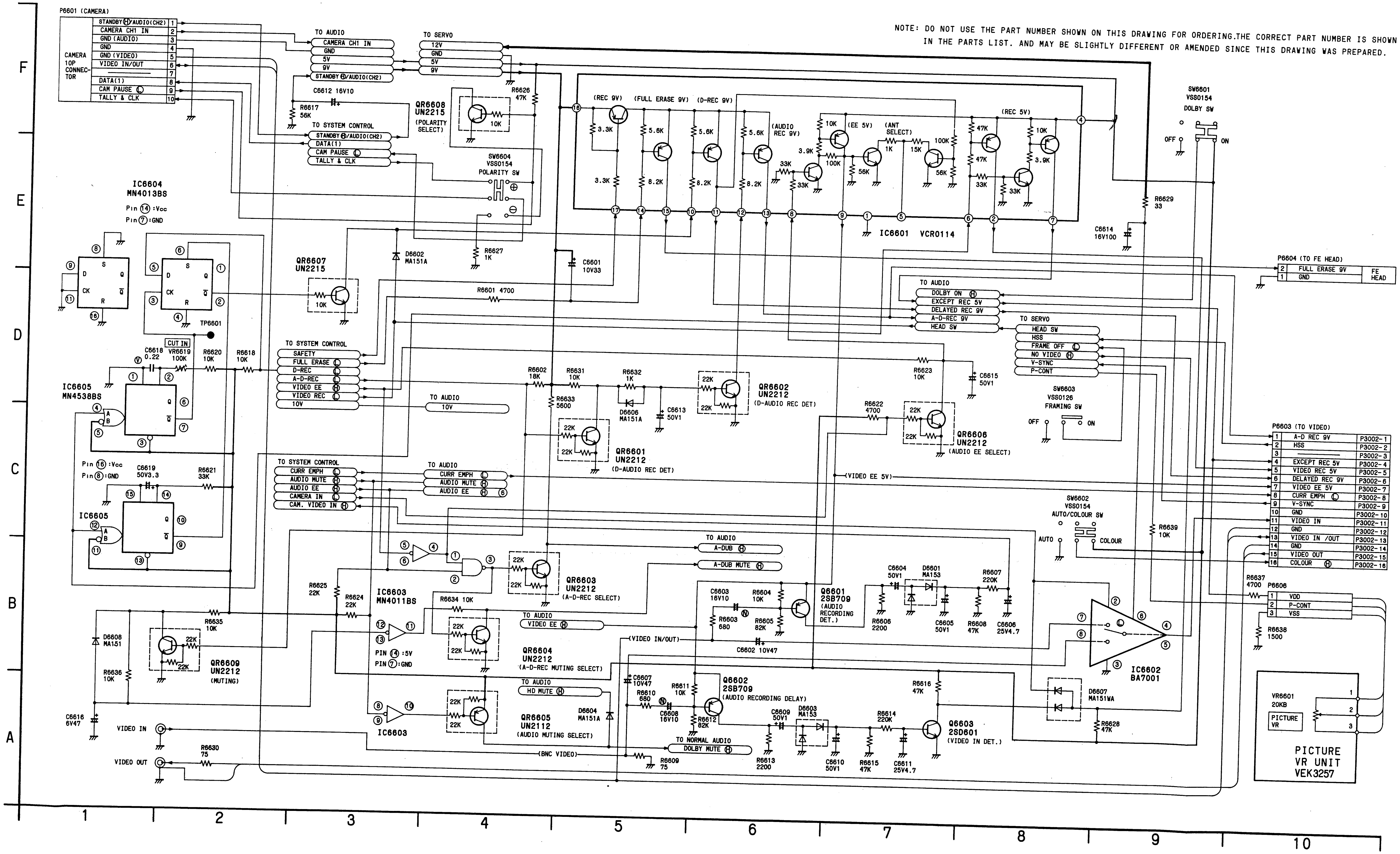
GRAM


TO SUB SYSTEM CTL
DOLBY NR ON Ⓗ
DOLBY SW
OFF
ON
+5V
P4404
2
FROM FRONT C.B.A.
IC4001 VEFA005
AUDIO MUTE Ⓗ
NOR.CH1 EE LEVEL
VR4009
AGC
DET
VR4001
CH1 P.B GAIN
VR4007, R4026, C4064
CH1 P.B EQ.
VR4005
CH1 REC CURR
REC 1.1Vp-p
P.B 0.9Vp-p
FL4401
L.P.F.
40mVp-p
AUDIO REC:ON
AUDIO EXCEPT REC:ON
TP4001
REC 1.15Vp-p
IC4401 NR8830
VCC
DOLBY NR Ⓗ:ON
(DOLBY CIRCUIT)
SCA
HPA
V/I CONV.
QR4007
A.DUB:ON
P.B 1.4Vp-p
DOLBY NR CHARACTERISTICS (IC4401)
0dB-580mV (400Hz)
VCC-12V
ENCODE(Rec)
DECODE(Play)
RESPONSE(dB)
FREQUENCY f(Hz)
100 300 1K 3K 10K 50K 100K
IC4402 μPD4066BG
CH1 EE
CH1 VV
QR4403
QR4404
TP4401
P4003
P4201
VR4202
NORMAL AUDIO LEVEL
VR4204
HD AUDIO LEVEL
VR4201
VR4203
P4201
P4003
TO HD AUDIO CIRCUIT
VR4010
NOR.CH2 EE LEVEL
P4004
LIMITER OFF Ⓗ
LINE IN
NORMAL CH2
P4203
FROM NORMAL AUDIO
NORMAL CH1
HD
FROM NORMAL AUDIO
FROM SUB SYSTEM CTL.
AUDIO E-E Ⓗ
LIMITER OFF Ⓗ
QR4004 A-DUB Ⓗ:ON
TO CH2
A-DUB Ⓗ
D4002
D4013
AUDIO D-REC Ⓗ
QR4006
TO CH2
AUDIO D-REC Ⓛ
AUDIO E-E Ⓗ
QR4001 LIMITER OFF Ⓗ:ON
1.5Vp-p
Q4001, T4001
BIAS OSC (70KHz) CIRCUIT
VR4004
CH2 BIAS CURR
VR4003
CH1 BIAS CURR
REC 35Vp-p
P4001
CH1 AUDIO ERASE HEAD
CH1 AUDIO HEAD
Q4701
Q4702
P4203 P4402 NORMAL CH1 OUT
QR4002 A-DUB Ⓗ:ON
DOLBY MUTE Ⓗ
Q4402 DOLBY MUTE Ⓗ:ON
+9V
RY4002
REC
P.B
REC Ⓗ ON
P4203 P4402 NORMAL CH2 OUT
TP4402
Q4403 DOLBY MUTE Ⓗ:ON
IC4702 AN6558S
Q4705, D4701
POWER OFF MUTING CIRCUIT
+10V
A-DUB MUTE Ⓗ
D4012
AUDIO MUTE Ⓗ
D4014
IC4201 AN6558S
LEVEL METER AMP
IC4002 VEFA005
MUTE
VR4002
CH2 P.B GAIN
VR4008, R4027, C4065
CH2 P.B EQ.
VR4006
CH2 REC CURR
FL4402
Q4404 TIME CODE IN:OFF
TP4002
IC4101 μPC393C
AMP
AUDIO E-E Ⓗ
LIMITER OFF Ⓗ
QR4003 LIMITER OFF Ⓗ:ON
AUDIO D-REC Ⓛ
QR4401
QR4402
CH2 EE
CH2 VV
35Vp-p
RY4001
AUDIO Ⓗ
T/C Ⓛ
P4002
CH2 AUDIO ERASE HEAD
CH2 AUDIO HEAD
QR4104
QR4103
D-REC:ON
SW4003
-20dB

MENT CONDITION OF THE WAVEFORM IS AS FOLLOWS
: 1kHz,-10dB(0.89Vp-p)
VRs : FIX POSITION

MAIN SIGNAL PATH IN RECORD MODE
MAIN SIGNAL PATH IN PLAYBACK MODE

SUB SYSTEM CONTROL SCHEMATIC DIAGRAM



NOTE: DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST. AND MAY BE SLIGHTLY DIFFERENT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

P6601 (CAMERA)
CAMERA 10P CONNECTOR
STANDBY Ⓗ/AUDIO(CH2)
CAMERA CH1 IN
GND (AUDIO)
GND
GND (VIDEO)
VIDEO IN/OUT
DATA(1)
CAM PAUSE Ⓛ
TALLY & CLK
TO AUDIO
TO SERVO
12V
5V
9V
TO SYSTEM CONTROL
QR6608 UN2215 (POLARITY SELECT)
SW6604 VSS0154 POLARITY SW
IC6604 MN4013BS
Pin ⑭:Vcc
Pin ⑦:GND
QR6607 UN2215
D6602 MA151A
C6601 10V33
R6601 4700
TP6601
CUT IN
IC6605 MN4538BS
SAFETY
FULL ERASE Ⓛ
D-REC
A-D-REC
VIDEO EE
VIDEO REC
10V
QR6602 UN2212 (D-AUDIO REC DET)
QR6601 UN2212 (D-AUDIO REC DET)
QR6606 UN2212 (AUDIO EE SELECT)
CURR EMPH
AUDIO MUTE
AUDIO EE
CAMERA IN
CAM. VIDEO IN
(VIDEO EE 5V)
IC6603 MN4011BS
QR6603 UN2212 (A-D-REC SELECT)
A-DUB
A-DUB MUTE
QR6609 UN2212 (MUTING)
QR6604 UN2212 (A-D-REC MUTING SELECT)
QR6605 UN2112 (AUDIO MUTING SELECT)
HD MUTE
D6604 MA151A
D6608 MA151
VIDEO IN
VIDEO OUT
(VIDEO IN/OUT)
(BNC VIDEO)
TO NORMAL AUDIO
DOLBY MUTE
Q6601 2SB709 (AUDIO RECORDING DET.)
Q6602 2SB709 (AUDIO RECORDING DELAY)
Q6603 2SD601 (VIDEO IN DET.)
D6601 MA153
D6603 MA153
IC6601 VCR0114
(REC 9V)
(FULL ERASE 9V)
(D-REC 9V)
(AUDIO REC 9V)
(EE 5V)
(ANT SELECT)
(REC 5V)
SW6601 VSS0154 DOLBY SW
OFF
ON
R6629 33
C6614 16V100
P6604 (TO FE HEAD)
FULL ERASE 9V
FE HEAD
DOLBY ON Ⓗ
EXCEPT REC 5V
DELAYED REC 9V
A-D-REC 9V
HEAD SW
HSS
FRAME OFF Ⓛ
NO VIDEO Ⓗ
V-SYNC
P-CONT
SW6603 VSS0126 FRAMING SW
SW6602 VSS0154 AUTO/COLOUR SW
AUTO
COLOUR
P6603 (TO VIDEO)
A-D REC 9V
VIDEO REC 5V
VIDEO EE 5V
CURR EMPH Ⓛ
COLOUR Ⓗ
P3002-1
P3002-16
P6606
VDD
VSS
IC6602 BA7001
D6607 MA151WA
VR6601 20KB
PICTURE VR
PICTURE VR UNIT VEK3257
A
B
C
D
E
F
1
2
3
4
5
6
7
8
9
10

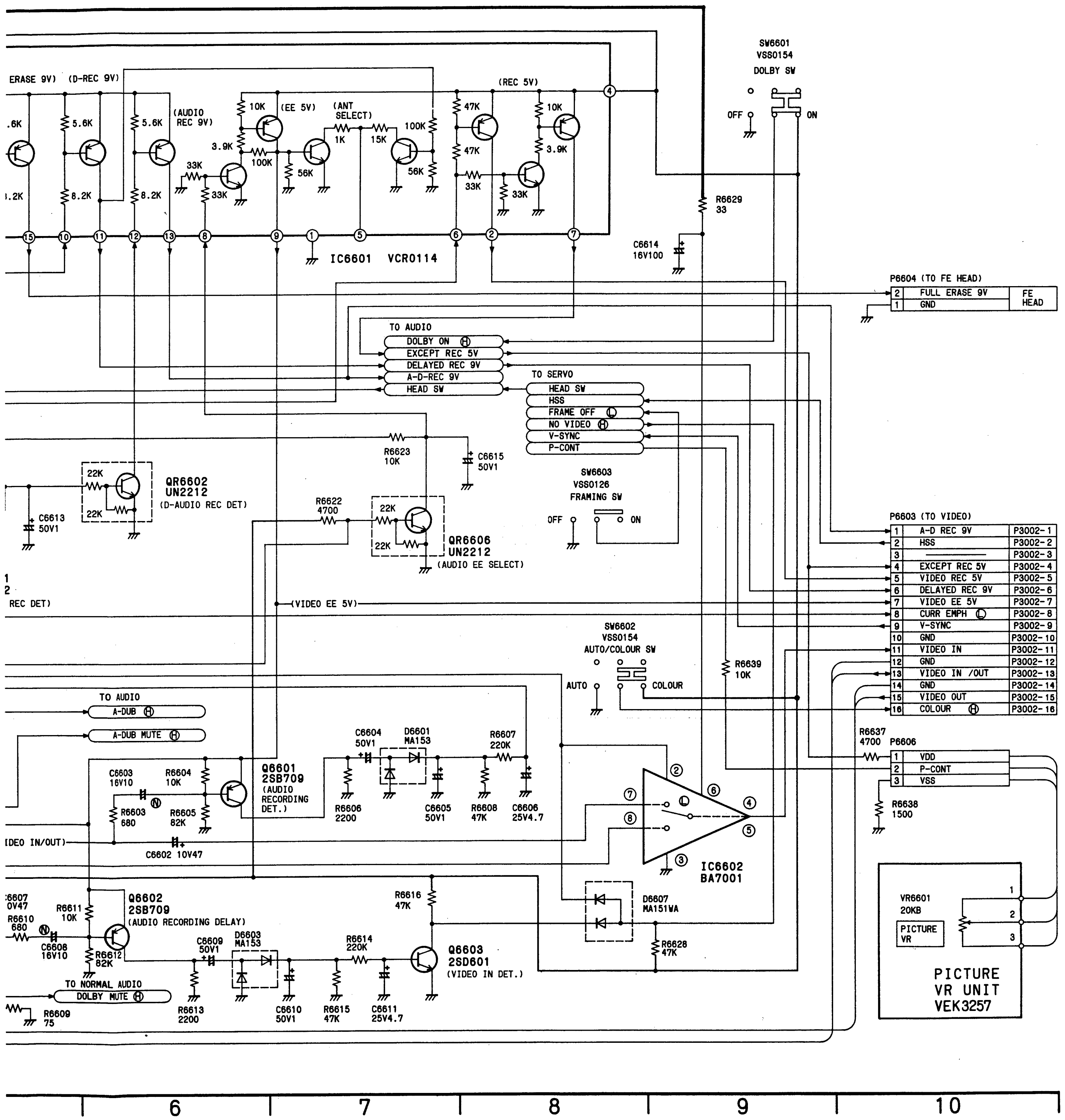
SUB SY

REF. NO.
MODE
STOP
PLAY
REC
F.F
REW
REF. NO.
MODE
STOP
PLAY
REC
F.F
REW
REF. NO.
MODE
STOP
PLAY
REC
F.F
REW
REF. NO.
MODE
STOP
PLAY
REC
F.F
REW
REF. NO.
MODE
STOP
PLAY
REC
F.F
REW

SUB SY

REF. NO.
MODE
STOP
PLAY
REC
F.F
REW
REF. NO.
MODE
STOP
PLAY
REC
F.F
REW
REF. NO.
MODE
STOP
PLAY
REC
F.F
REW

NOTE: DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST. AND MAY BE SLIGHTLY DIFFERENT OR AMENDED SINCE THIS DRAWING WAS PREPARED.


ERASE 9V)
(D-REC 9V)
(AUDIO REC 9V)
(EE 5V)
(ANT SELECT)
(REC 5V)
.6K
5.6K
5.6K
.2K
8.2K
8.2K
10K
3.9K
33K
33K
100K
56K
1K
15K
100K
56K
47K
47K
33K
33K
10K
3.9K
IC6601 VCR0114
R6629
33
C6614
16V100
SW6601
VSS0154
DOLBY SW
OFF
ON
P6604 (TO FE HEAD)
2 FULL ERASE 9V
1 GND
FE HEAD
TO AUDIO
DOLBY ON Ⓗ
EXCEPT REC 5V
DELAYED REC 9V
A-D-REC 9V
HEAD SW
TO SERVO
HEAD SW
HSS
FRAME OFF Ⓛ
NO VIDEO Ⓗ
V-SYNC
P-CONT
R6623
10K
C6615
50V1
SW6603
VSS0126
FRAMING SW
OFF
ON
22K
22K
QR6602
UN2212
(D-AUDIO REC DET)
C6613
50V1
R6622
4700
22K
22K
QR6606
UN2212
(AUDIO EE SELECT)
REC DET)
(VIDEO EE 5V)
P6603 (TO VIDEO)
1 A-D REC 9V P3002-1
2 HSS P3002-2
3 P3002-3
4 EXCEPT REC 5V P3002-4
5 VIDEO REC 5V P3002-5
6 DELAYED REC 9V P3002-6
7 VIDEO EE 5V P3002-7
8 CURR EMPH Ⓛ P3002-8
9 V-SYNC P3002-9
10 GND P3002-10
11 VIDEO IN P3002-11
12 GND P3002-12
13 VIDEO IN /OUT P3002-13
14 GND P3002-14
15 VIDEO OUT P3002-15
16 COLOUR Ⓗ P3002-16
SW6602
VSS0154
AUTO/COLOUR SW
AUTO
COLOUR
R6639
10K
TO AUDIO
A-DUB Ⓗ
A-DUB MUTE Ⓗ
C6603
16V10
R6604
10K
R6603
680
R6605
82K
Q6601
2SB709
(AUDIO RECORDING DET.)
C6604
50V1
D6601
MA153
R6607
220K
R6606
2200
C6605
50V1
R6608
47K
C6606
25V4.7
IDEO IN/OUT)
C6602 10V47
IC6602
BA7001
R6637
4700
P6606
1 VDD
2 P-CONT
3 VSS
R6638
1500
D6607
MA151WA
R6628
47K
VR6601
20KB
PICTURE VR
PICTURE VR UNIT VEK3257
Q6602
2SB709
(AUDIO RECORDING DELAY)
R6611
10K
R6610
680
C6608
16V10
R6612
82K
C6609
50V1
D6603
MA153
R6614
220K
R6616
47K
Q6603
2SD601
(VIDEO IN DET.)
TO NORMAL AUDIO
DOLBY MUTE Ⓗ
R6609
75
R6613
2200
C6610
50V1
R6615
47K
C6611
25V4.7
6
7
8
9
10

SUB SYSTEM CONTROL ICs DC VOLTAGE CHART

REF. NO.	IC6601																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17			
STOP	0	−0.2	0	5.1	0.9	4.5	4.9	3.9	5.0	9.4	0	9.4	0	9.4	0.3	9.4	0.6			
PLAY	0	−0.2	0	5.1	0	4.5	4.9	0	0	9.4	0	9.4	0	9.4	0.3	9.4	0.6			
REC	0	5.1	0	5.1	0	0.1	0	3.9	5.0	0	9.1	0	9.1	3.2	9.2	9.4	0.6			
F.F	0	−0.2	0	5.1	1.0	4.5	4.9	3.9	5.0	9.4	0	9.4	0	9.4	0.3	9.4	0.6			
REW	0	−0.2	0	5.1	1.1	4.5	4.9	3.9	5.0	9.4	0	9.4	0	9.4	0.3	9.4	0.6			

REF. NO.	IC6602																			
MODE	1	2	3	4	5	6	7	8												
STOP	0	4.7	0	6.6	6.6	12.9	7.7	7.4												
PLAY	0	4.7	0	6.6	6.6	12.9	7.7	7.4												
REC	0	4.7	0	6.6	6.6	12.9	7.7	7.4												
F.F	0	4.7	0	6.6	6.6	12.9	7.7	7.4												
REW	0	4.7	0	6.6	6.6	12.9	7.7	7.4												

REF. NO.	IC6603																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14						
STOP	0.2	4.8	5.0	0.2	4.8	4.8	0	0	0	5.1	5.0	0	0	5.1						
PLAY	5.1	0	5.0	5.1	0	0	0	0	0	5.1	5.0	0	0	5.1						
REC	0.2	4.8	5.0	0.2	4.8	4.8	0	0	0	5.1	0	5.2	5.2	5.1						
F.F	0.2	—	5.0	0.2	4.8	4.8	0	0	0	5.1	5.0	0	0	5.1						
REW	0.2	0.5	5.0	0.2	4.8	4.8	0	0	0	5.1	5.0	0	0	5.1						

REF. NO.	IC6604																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14						
STOP	5.1	0	5.1	0	5.1	5.1	0	0	0	0	0	0	5.1	5.1						
PLAY	5.1	0	—	0	5.1	0	0	0	0	0	0	0	5.1	5.1						
REC	0	5.0	—	0	0.1	0	0	0	0	0	0	0	5.1	5.1						
F.F	5.1	0	5.1	0	5.1	5.1	0	0	0	0	0	0	5.1	0						
REW	5.1	0	5.1	0	5.1	5.1	0	0	0	0	0	0	5.1	5.1						

REF. NO.	IC6605																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	0	5.0	5.1	0	5.1	0	5.1	0	5.1	0	5.1	0	5.1	5.1	0	5.1				
PLAY	0	—	5.1	—	5.1	—	—	0	0	5.1	5.1	—	5.1	—	0	5.1				
REC	0	—	5.1	—	5.1	—	—	0	0	5.1	5.1	—	5.1	—	0	5.1				
F.F	0	5.0	5.1	3.9	5.1	0	5.1	0	5.1	0	5.1	3.9	5.1	5.1	0	5.1				
REW	0	5.0	5.1	3.9	5.1	0	5.1	0	5.1	0	5.1	3.9	5.1	5.1	0	5.1				

SUB SYSTEM CONTROL TRANSISTORs DC VOLTAGE CHART

REF. NO.	Q6601			Q6602			Q6603											
MODE	E	C	B	E	C	B	E	C	B									
STOP	5.0	0.1	4.5	5.0	1.1	4.6	0	0	0.6									
PLAY	0	0	0	0	0	0	0	5.0	0									
REC	5.0	0.1	4.5	5.0	1.1	4.6	0	0	0.6									
F.F	5.0	0.1	4.5	5.0	1.1	4.6	0	0	0.6									
REW	5.0	0.1	4.5	5.0	1.1	4.6	0	0	0.6									

REF. NO.	QR6601			QR6602			QR6603			QR6604			QR6605			QR6606		
MODE	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP	0	0	3.8	0	9.4	0	0	0	0	0	0	5.0	5.1	−0.8	5.1	0	0	0.2
PLAY	0	0	3.8	0	9.4	0	0	0	0	0	0	5.0	5.1	−0.8	5.1	0	0	5.1
REC	0	6.6	0.1	0	0	6.4	0	0	5.0	0	0	5.0	5.1	−0.8	5.1	0	3.8	0.2
F.F	0	0	3.8	0	9.4	0	0	0	5.0	0	0	5.0	5.1	−0.8	5.1	0	3.8	0.2
REW	0	0	3.8	0	9.4	0	0	0	5.0	0	0	5.0	5.1	−0.8	5.1	0	3.8	0.2

REF. NO.	QR6607			QR6608			QR6609											
MODE	E	C	B	E	C	B	E	C	B									
STOP	0	9.4	0	0	0	2.2	0	0	3.8									
PLAY	0	9.4	0	0	0	2.2	0	0	3.8									
REC	0	0	5.0	0	0	2.2	0	5.2	0.1									
F.F	0	9.4	0	0	0	2.2	0	0	3.8									
REW	0	9.4	0	0	0	2.2	0	0	3.8									

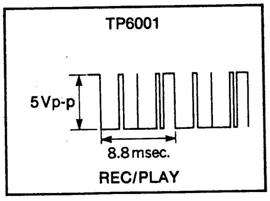
SYSTEM CONTROL ICs DC VOLTAGE CHART

REF. NO.	IC6001																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	4.8	3.8	4.9	4.9	4.5	0.6	3.5	5.0	3.0	4.9	5.0	4.9	5.1	2.0	0	0	4.9	0	0	0
PLAY	4.8	3.8	4.9	4.9	4.5	0.6	4.7	5.0	3.0	4.9	5.0	4.9	5.1	2.0	0	0	4.9	0	0	0
REC	4.8	3.8	4.9	4.9	4.5	0.6	—	5.0	3.0	4.9	5.0	4.9	5.1	2.0	0	0	4.9	0	0	0
F.F	4.8	3.8	4.9	4.9	4.5	0.6	—	5.0	3.0	4.9	5.0	4.9	5.1	2.0	0	0	4.9	0	0	0
REW	4.8	3.8	4.9	4.9	4.5	0.6	4.6	5.0	3.0	4.9	5.0	4.9	5.1	2.0	0	0	—	0	0	0
REF. NO.	IC6001																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
STOP	4.9	4.5	4.7	3.6	0	0.7	4.6	0	4.7	4.8	5.1	3.8	9.4	9.4	4.6	0	2.0	4.8	2.0	0
PLAY	4.9	4.5	4.7	4.6	0	0.7	0	0	0	0	5.1	3.8	9.4	9.4	0	4.9	0	2.0	2.0	4.9
REC	4.9	4.6	4.7	—	0	0.7	4.6	0	4.7	4.8	0.1	0.1	0.1	9.4	0	4.9	0	4.8	0	4.9
F.F	4.9	4.5	4.7	—	0	0.7	4.6	0	4.7	4.8	5.1	3.8	9.4	0.1	4.6	0	2.0	4.8	2.0	0
REW	4.9	4.5	4.7	—	0	0.7	4.6	0	4.7	4.8	5.1	3.8	9.4	0.1	4.6	0	2.0	4.8	2.0	0
REF. NO.	IC6001																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
STOP	2.0	0	0	4.5	4.9	4.9	0	0	5.3	0.1	0	0	4.8	4.8	2.8	4.9	0	0.9	1.4	0.7
PLAY	0	0	4.8	4.5	0	4.9	0	0	5.3	0.1	0	0	0	0	2.8	4.9	0	0.9	1.4	0.7
REC	0	0	4.8	0.1	0	4.8	0	0	5.3	0.1	0	0	0	0	2.8	4.9	0	0.9	1.4	0.7
F.F	0	4.8	4.8	4.5	4.9	4.9	0	0	5.3	0.1	0	0	0	0	2.8	4.9	0	0.9	1.4	0.7
REW	4.9	4.8	4.8	4.5	4.9	0	0	0	5.3	0.1	0	0	0	0	2.8	4.9	0	0.9	1.4	0.7
REF. NO.	IC6001										IC6002									
MODE	61	62	63	64							1	2	3	4	5	6	7	8	9	10
STOP	4.9	1.1	1.1	4.9							0	0.5	0.9	0.7	0	0	13.5	13.4	1.0	0.5
PLAY	4.9	1.1	4.9	4.9							0	0.5	0.9	0.7	0	0	13.4	13.4	1.0	0.5
REC	4.9	1.1	4.9	4.9							0	0.5	0.9	0.7	0	0	13.4	13.4	1.0	0.5
F.F	4.9	1.1	1.1	4.9							0	0	0.9	0.7	0	0	13.4	13.4	1.0	0.1
REW	4.9	1.1	1.1	4.9							0	0	0.9	0.7	0	0	13.4	13.4	1.0	0.1
REF. NO.	IC6003																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	0.9		0.9	1.5	3.5	0				0.9	4.8	4.8	4.5	5.1	4.8	0	13.4	3.7	5.3	5.1
PLAY	0.9		0.9	1.5	—	0				0.9	4.8	4.8	4.5	5.1	4.8	0	13.4	0	5.3	5.1
REC	—		0.9	1.5	—	0				—	4.8	4.8	4.5	5.1	4.8	0	13.4	3.7	5.3	5.1
F.F	—		—	1.5	—	0				—	4.8	4.8	4.5	5.1	4.8	0	13.4	3.7	5.3	5.1
REW	—		0.9	1.5	—	0				—	4.8	4.8	4.5	5.1	4.8	0	13.4	3.7	5.3	5.1
REF. NO.	IC6005										IC6006									
MODE	I	G	O								1	2	3	4	5	6	7	8		
STOP	12.6	0	5.1								2.3	0	5.1	2.5	2.6	0	2.8	2.2		
PLAY	12.6	0	5.1								2.3	0	5.1	2.5	2.6	0	2.8	2.2		
REC	12.6	0	5.1								2.3	0	5.1	2.5	2.6	0	2.8	2.2		
F.F	12.6	0	5.1								2.3	0	5.1	2.5	2.6	0	2.8	2.2		
REW	12.6	0	5.1								2.3	0	5.1	2.5	2.6	0	2.8	2.2		
REF. NO.	IC6007																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	0	0.1	4.9	0	3.5	3.9	4.4	4.9	4.9	0	0	4.9	4.9	0	4.8	0	0	0	0	2.4
PLAY	0	0.1	4.9	0	—	3.7	4.4	4.9	4.9	0	0	4.9	4.9	0	4.8	0	0	0	0	2.4
REC	0	0.1	4.9	0	4.6	0.2	4.4	4.9	4.9	0	0	4.9	4.9	0	0	0	0	0	0	2.4
F.F	0	0.1	4.9	0	4.6	—	4.4	4.9	4.9	0	0	4.9	4.9	0	4.8	0	0	0	0	2.4
REW	0	0.1	4.9	0	—	—	4.4	4.9	4.9	0	0	0	0	0	4.8	0	0	0	0	2.4
REF. NO.	IC6007																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
STOP	2.5	0	4.8	4.9	4.9	4.9	4.8	4.8	4.8	4.8	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
PLAY	2.5	0	4.8	4.9	4.9	4.9	4.8	4.8	4.8	4.8	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
REC	2.5	0	4.8	4.9	4.9	4.9	4.8	4.8	4.8	4.8	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
F.F	2.5	0	4.8	4.9	4.9	4.9	4.8	4.8	4.8	4.8	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
REW	2.5	0	4.8	4.9	4.9	4.9	4.8	4.8	4.8	4.8	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
REF. NO.	IC6007																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
STOP	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	0	0	2.6	4.9	2.3	5.1
PLAY	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	—	0	2.6	4.9	2.3	5.1
REC	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	—	0	2.6	4.9	2.3	5.1
F.F	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	0	0	2.6	4.9	2.3	5.1
REW	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	0	0	2.6	4.9	2.3	5.1
REF. NO.	IC6007																			
MODE	61	62	63	64																
STOP	0	5.1	0.1	0.1																
PLAY	—	5.1	—	0.1																
REC	—	—	—	0.1																
F.F	3.9	—	—	0.1																
REW	3.9	—	2.6	0.1																

SYSTEM CONTROL TRANSISTORs DC VOLTAGE CHART

REF. NO.	Q6001			Q6002			Q6005			Q6006			Q6007			Q6008		
MODE	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP	12.7	12.6	12.0	0	0.9	0.6	5.2	−0.1	6.7	0	13.0	0	13.4	0	13.0	−0.8	13.4	−0.6
PLAY	12.7	12.6	12.0	0	4.6	0.6	5.2	0	6.7	0	13.0	0	13.4	0	13.0	−0.7	13.4	−0.4
REC	12.7	12.6	11.0	0	—	—	5.2	0	6.7	0	13.0	0	13.4	0	13.0	−0.6	13.4	−0.4
F.F	12.7	12.6	12.0	0	—	—	5.2	−0.1	6.7	0	13.0	0	13.4	0	13.0	8.8	13.4	9.4
REW	12.7	12.6	12.0	0	—	—	0	−0.1	0	0	13.0	0	13.4	0	13.0	8.8	13.4	9.4
REF. NO.	Q6009			Q6010			Q6011			Q6012			Q6013			Q6014		
MODE	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP	12.7	12.7	12.0	0	0.1	0.7	0	−0.1	0	6.3	10.1	7.0	0	0	0	0	0	0.6
PLAY	12.7	12.7	12.0	0	0.1	0.7	0	0	0.6	6.3	10.1	7.0	0	4.8	0	0	0	0.6
REC	12.7	12.7	12.0	0	0.1	0.7	0	0	0.6	6.3	10.1	7.0	0	4.8	0	0	0	0.6
F.F	12.7	12.7	12.0	0	0.1	0.7	0	−0.1	0	6.3	10.1	7.0	0	4.8	0	0	0	0.6
REW	12.7	12.7	12.0	0	0.1	0.7	0	−0.1	0	6.3	10.1	7.0	0	4.8	0	0	0	0.6
REF. NO.	Q6015			Q6016														
MODE	E	C	B	E	C	B												
STOP	0	5.0	0	5.1	0	5.0												
PLAY	0	5.0	0	5.1	0	5.0												
REC	0	5.0	0	5.1	0	5.0												
F.F	0	5.0	0	5.1	0	5.0												
REW	0	5.0	0	5.1	0	5.0												
REF. NO.	QR6001			QR6002			QR6003			QR6004			QR6005			QR6006		
MODE	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP	0	5.1	0	9.4	−0.5	9.4	5.1	−1.0	4.9	0	5.3	0	0	4.6	0	0	0	5.2
PLAY	0	5.1	0	9.4	−0.5	9.4	5.1	−0.9	4.9	0	5.3	0	0	2.0	0	0	0	5.2
REC	0	5.1	0	9.4	−0.5	9.4	5.1	−0.8	4.9	0	5.3	0	0	4.6	0	0	0	5.2
F.F	0	5.1	0	9.4	9.4	0.1	5.1	−1.0	4.9	0	5.3	0	0	4.6	0	0	0	5.2
REW	0	5.1	0	9.4	9.4	0.1	5.1	−1.0	4.9	0	5.3	0	0	4.6	0	0	0	5.2
REF. NO.	QR6007			QR6008			QR6009			QR6010			QR6011					
MODE	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B			
STOP	0	0.1	0	0	0	2.4	0	0.7	0.1	0	0	4.5	0	12.5	0.1			
PLAY	0	0.1	0	0	0	2.4	0	0.7	0.1	0	0.6	0	0	12.5	0.1			
REC	0	0.1	0	0	0	2.4	0	0.7	0.1	0	0.6	0	0	12.5	0.1			
F.F	0	0.1	0	0	0	2.4	0	0.7	0.1	0	0	4.5	0	12.5	0.1			
REW	0	0.1	0	0	0	2.4	0	0.7	0.1	0	0	4.5	0	12.5	0.1			

SYSTEM CONTROL



SYSTEM CONTROL SCHEMATIC DIAGRAM

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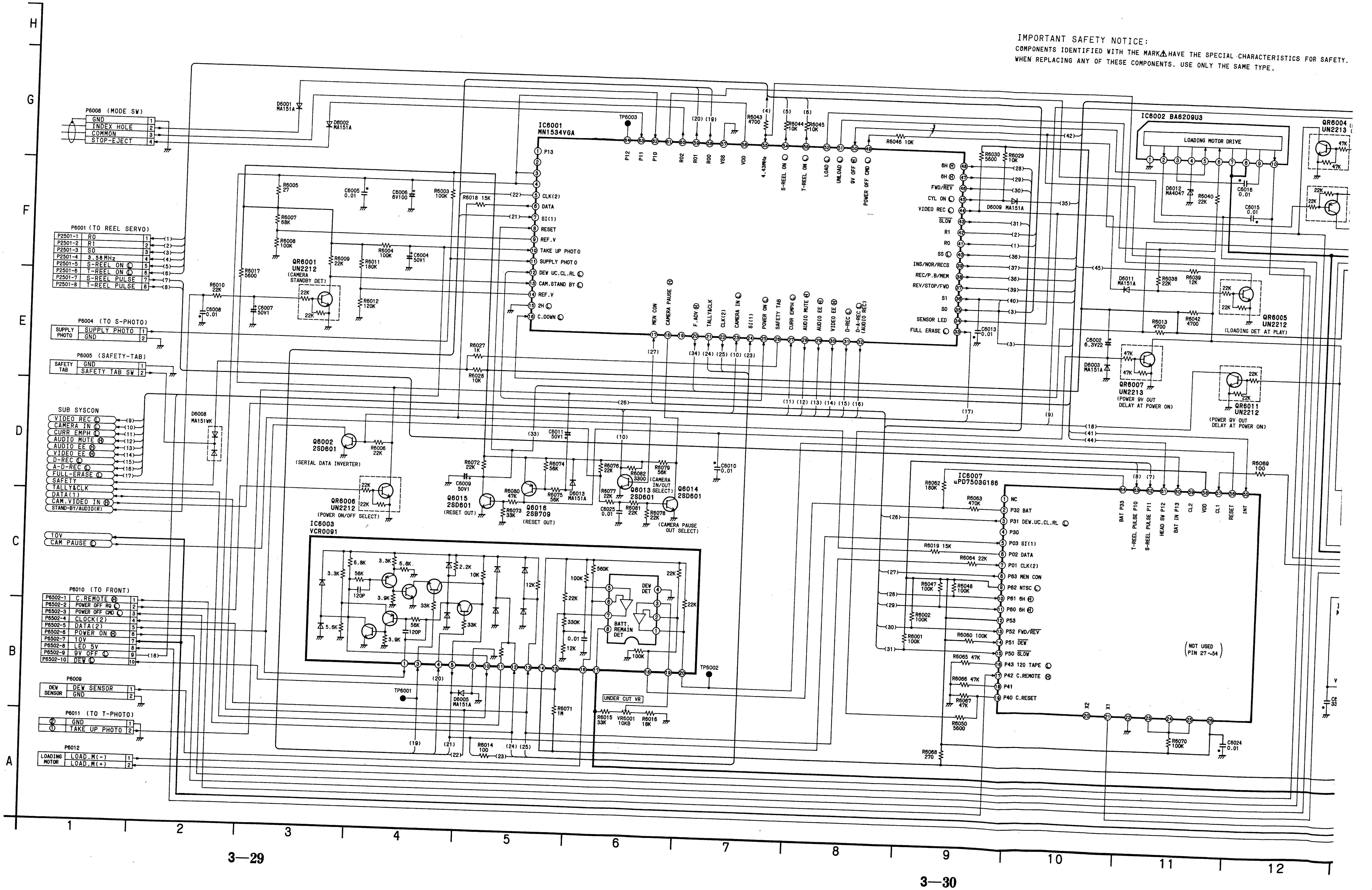

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11
12
P6008 (MODE SW)
GND
INDEX HOLE
COMMON
STOP-EJECT
P6001 (TO REEL SERVO)
P2501-1 RO
P2501-2 R1
P2501-3 SO
P2501-4 3.58MHz
P2501-5 S-REEL ON
P2501-6 T-REEL ON
P2501-7 S-REEL PULSE
P2501-8 T-REEL PULSE
P6004 (TO S-PHOTO)
SUPPLY PHOTO
GND
P6005 (SAFETY-TAB)
SAFETY TAB
GND
SAFETY TAB SW
SUB SYSCON
VIDEO REC
CAMERA IN
CURR EMPH
AUDIO MUTE
AUDIO EE
VIDEO EE
D-REC
A-D-REC
FULL-ERASE
SAFETY
TALLY&CLK
DATA(1)
CAM.VIDEO IN
STAND-BY/AUDIO(R)
10V
CAM PAUSE
P6010 (TO FRONT)
P6502-1 C.REMOTE
P6502-2 POWER OFF RQ
P6502-3 POWER OFF CMD
P6502-4 CLOCK(2)
P6502-5 DATA(2)
P6502-6 POWER ON
P6502-7 10V
P6502-8 LED 5V
P6502-9 9V OFF
P6502-10 DEW
P6009
DEW SENSOR
DEW SENSOR
GND
P6011 (TO T-PHOTO)
GND
TAKE UP PHOTO
P6012
LOADING MOTOR
LOAD.M(-)
LOAD.M(+)
D6001 MA151A
D6002 MA151A
R6005 27
R6007 68K
R6008 100K
C6005 0.01
C6006 6V100
R6003 100K
R6018 15K
R6017 5600
R6010 22K
C6008 0.01
C6007 50V1
QR6001 UN2212 (CAMERA STANDBY DET)
R6009 22K
R6004 100K
R6011 180K
C6004 50V1
R6012 120K
IC6001 MN1534VGA
TP6003
P13
CLK(2)
DATA
SI(1)
RESET
REF.V
TAKE UP PHOTO
SUPPLY PHOTO
DEW UC.CL.RL
CAM.STAND BY
REF.V
2H
C.DOWN
P12
P11
P10
R02
R01
R00
VSS
VDD
4.43MHz
S-REEL ON
T-REEL ON
LOAD
UNLOAD
9V OFF
POWER OFF CMD
R6043 4700
R6044 10K
R6045 10K
R6046 10K
R6030 5600
R6029 10K
6H
6H
FWD/REV
CYL ON
VIDEO REC
SLOW
R1
R0
SS
INS/NOR/RECS
REC/P.B/MEM
REV/STOP/FWD
S1
S0
SENSOR LED
FULL ERASE
D6009 MA151A
C6013 0.01
MEM CON
CAMERA PAUSE
F.ADV
TALLY&CLK
CLK(2)
CAMERA IN
SI(1)
POWER ON
SAFETY TAB
CURR EMPH
AUDIO MUTE
AUDIO EE
VIDEO EE
D-REC
D-A-REC (AUDIO REC)
R6027 1K
R6028 10K
IC6002 BA6209U3
LOADING MOTOR DRIVE
D5012 MA4047
R6040 22K
C6016 0.01
C6015 0.01
QR6004 UN2213
47K
47K
22K
22K
D6011 MA151A
R6038 22K
R6039 12K
QR6005 UN2212 (LOADING DET AT PLAY)
R6013 4700
R6042 4700
C6002 6.3V22
D6003 MA151A
QR6007 UN2213 (POWER 9V OUT DELAY AT POWER ON)
QR6011 UN2212 (POWER 9V OUT DELAY AT POWER ON)
D6008 MA151WK
Q6002 2SD601 (SERIAL DATA INVERTER)
R6006 22K
QR6006 UN2212 (POWER ON/OFF SELECT)
C6011 50V1
R6072 22K
C6009 50V1
Q6015 2SD601 (RESET OUT)
R6080 47K
R6073 33K
Q6016 2SB709 (RESET OUT)
R6074 56K
R6075 56K
D6013 MA151A
R6076 22K
R6082 3300
R6079 56K
Q6013 2SD601 (CAMERA IN/OUT SELECT)
R6077 22K
R6081 22K
R6078 22K
C6025 0.01
Q6014 2SD601 (CAMERA PAUSE OUT SELECT)
C6010 0.01
IC6003 VCR0091
6.8K
3.3K
56K
120P
3.9K
5.6K
33K
2.2K
10K
12K
33K
56K
120P
3.9K
560K
100K
22K
330K
0.01
12K
DEW DET
BATT. REMAIN DET
22K
22K
100K
TP6001
TP6002
D6005 MA151A
R6071 1M
UNDER CUT VR
R6015 33K
VR6001 10KB
R6016 18K
R6014 100
IC6007 uPD7503G186
R6062 180K
R6063 470K
R6069 100
NC
P32 BAT
P31 DEW.UC.CL.RL
P30
P03 SI(1)
P02 DATA
P01 CLK(2)
P63 MEM CON
P62 NTSC
P61 6H
P60 6H
P53
P52 FWD/REV
P51 DEV
P50 SLOW
P43 120 TAPE
P42 C.REMOTE
P41
P40 C.RESET
R6019 15K
R6064 22K
R6047 100K
R6048 100K
R6002 100K
R6001 100K
R6060 100K
R6065 47K
R6066 47K
R6067 47K
R6050 5600
R6068 270
BAT P33
T-REEL PULSE P10
S-REEL PULSE P11
HEAD SW P12
BAT IN P13
CL2
VDD
CL1
RESET
INT
X2
X1
(NOT USED PIN 27~34)
R6070 100K
C6024 0.01

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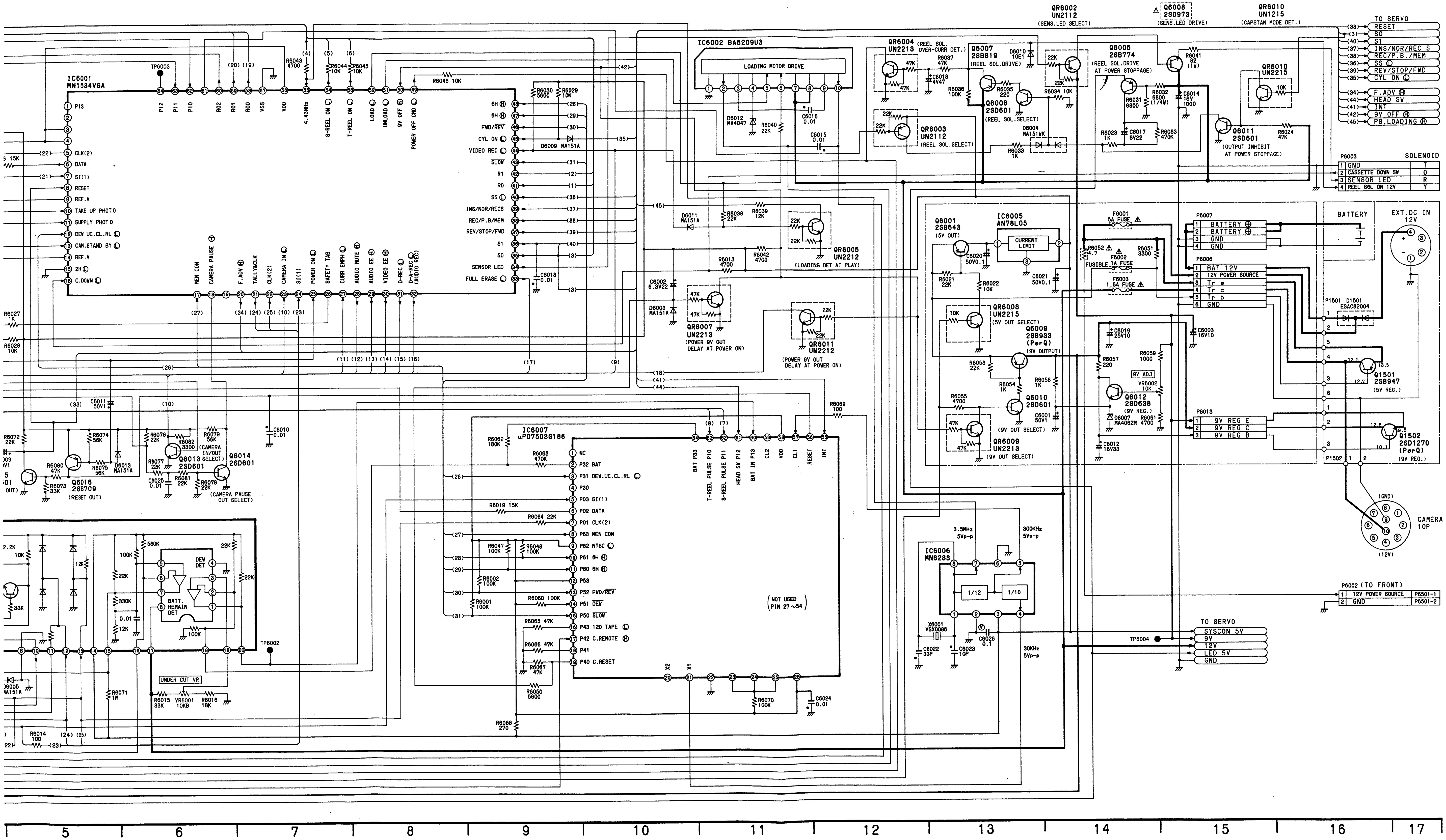
IC6001
MN1534VGA
IC6002 BA6209U3
LOADING MOTOR DRIVE
IC6005
AN78L05
CURRENT LIMIT
IC6006
MN6283
IC6007
uPD7503G186
QR6002
UN2112
(SENS.LED SELECT)
Q6008
2SD973
(SENS.LED DRIVE)
QR6010
UN1215
(CAPSTAN MODE DET.)
QR6004
UN2213
(REEL SOL. OVER-CURR DET.)
Q6007
2SB819
(REEL SOL.DRIVE)
Q6006
2SD601
(REEL SOL.SELECT)
QR6003
UN2112
(REEL SOL.SELECT)
Q6005
2SB774
(REEL SOL.DRIVE AT POWER STOPPAGE)
Q6011
2SD601
(OUTPUT INHIBIT AT POWER STOPPAGE)
QR6005
UN2212
(LOADING DET AT PLAY)
QR6007
UN2213
(POWER 9V OUT DELAY AT POWER ON)
QR6011
UN2212
(POWER 9V OUT DELAY AT POWER ON)
Q6001
2SB643
(5V OUT)
QR6008
UN2215
(5V OUT SELECT)
Q6009
2SB933
(PorQ)
(9V OUTPUT)
Q6010
2SD601
QR6009
UN2213
(9V OUT SELECT)
Q6012
2SD636
(9V REG.)
Q1501
2SB947
(5V REG.)
Q1502
2SD1270
(PorQ)
(9V REG.)
Q6013
2SD601
(CAMERA IN/OUT SELECT)
Q6014
2SD601
(CAMERA PAUSE OUT SELECT)
Q6016
2SB709
(RESET OUT)
TO SERVO
RESET
SO
S1
INS/NOR/REC S
REC/P.B./MEM
SS
REV/STOP/FWD
CYL ON
F.ADV
HEAD SW
INT
9V OFF
PB.LOADING
P6003
SOLENOID
GND
CASSETTE DOWN SW
SENSOR LED
REEL SOL ON 12V
P6007
BATTERY
GND
P6006
BAT 12V
12V POWER SOURCE
Tr e
Tr c
Tr b
P6013
9V REG E
9V REG C
9V REG B
BATTERY
EXT.DC IN 12V
P1501 D1501
ESAC82004
P1502
CAMERA 10P
(GND)
(12V)
F6001 5A FUSE
F6002 FUSIBLE 1A FUSE
F6003 1.6A FUSE
9V ADJ
VR6002 10K
P6002 (TO FRONT)
12V POWER SOURCE P6501-1
GND P6501-2
TO SERVO
SYSCON 5V
9V
12V
LED 5V
GND
TP6003
TP6002
TP6004
X6001 VSX0086
3.5MHz 5Vp-p
300KHz 5Vp-p
30KHz 5Vp-p
1/12
1/10
BATT. REMAIN DET
DEW DET
UNDER CUT VR
VR6001 10KB
(NOT USED PIN 27~54)
5
6
7
8
9
10
11
12
13
14
15
16
17

SERVO SCHEMATIC DIAGRAM

CYLINDER SERVO SPEED LOOP
CYLINDER SERVO PHASE LOOP
CAPSTAN SERVO SPEED LOOP
CAPSTAN SERVO PHASE LOOP

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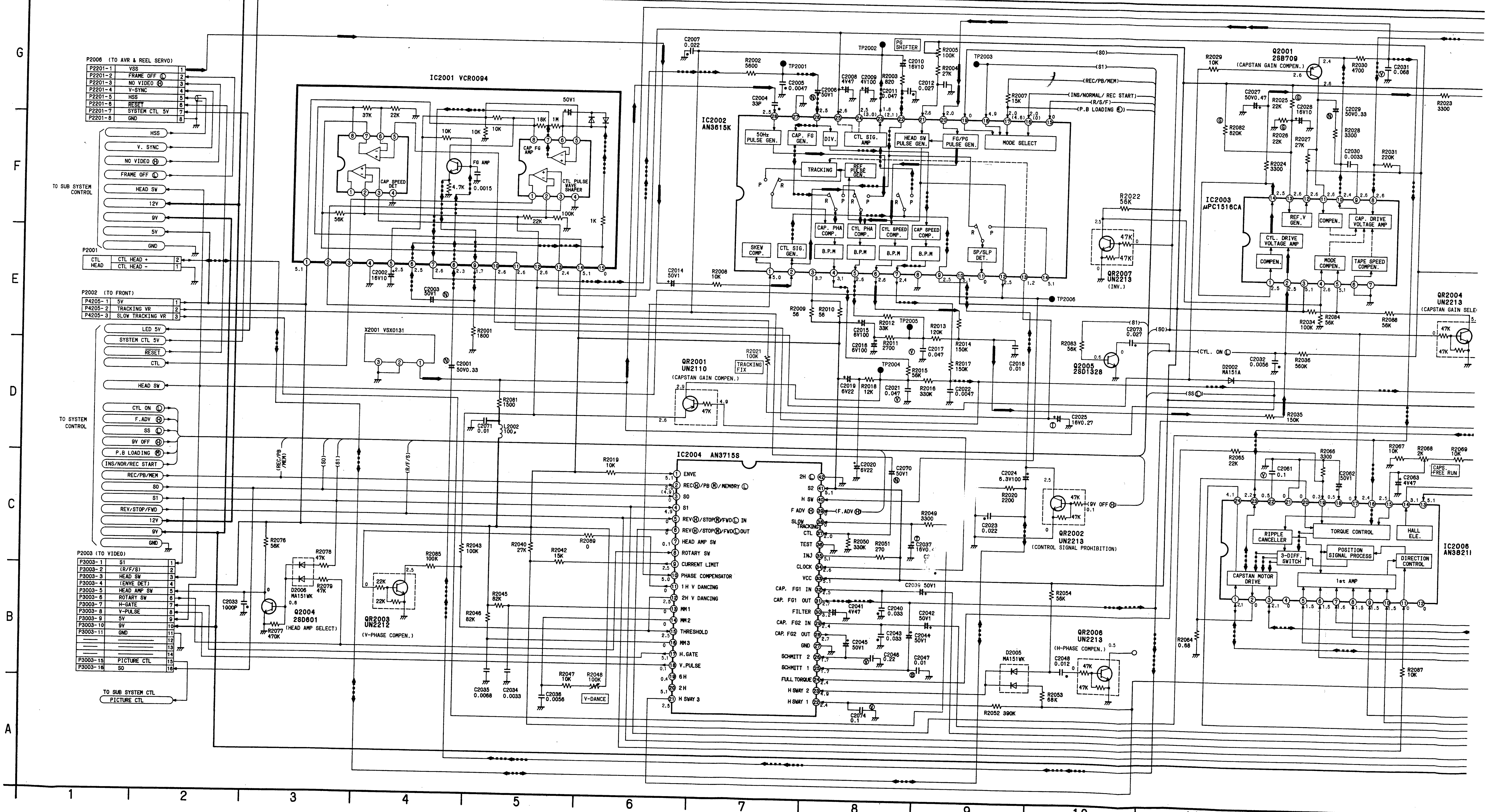
H
G
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E
D
C
B
A
1
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3
4
5
6
7
8
9
10
11
12
13
P2006 (TO AVR & REEL SERVO)
P2201-1 VSS
P2201-2 FRAME OFF
P2201-3 NO VIDEO
P2201-4 V-SYNC
P2201-5 HSS
P2201-6 RESET
P2201-7 SYSTEM CTL 5V
P2201-8 GND
TO SUB SYSTEM CONTROL
HSS
V. SYNC
NO VIDEO
FRAME OFF
HEAD SW
12V
9V
5V
GND
P2001
CTL HEAD
CTL HEAD +
CTL HEAD -
P2002 (TO FRONT)
P4205-1 5V
P4205-2 TRACKING VR
P4205-3 SLOW TRACKING VR
LED 5V
SYSTEM CTL 5V
RESET
CTL
HEAD SW
TO SYSTEM CONTROL
CYL ON
F.ADV
SS
9V OFF
P.B LOADING
INS/NOR/REC START
REC/PB/MEM
S0
S1
REV/STOP/FWD
12V
9V
GND
P2003 (TO VIDEO)
P3003-1 S1
P3003-2 (R/F/S)
P3003-3 HEAD SW
P3003-4 (ENVE DET)
P3003-5 HEAD AMP SW
P3003-6 ROTARY SW
P3003-7 H-GATE
P3003-8 V-PULSE
P3003-9 5V
P3003-10 9V
P3003-11 GND
P3003-15 PICTURE CTL
P3003-16 S0
TO SUB SYSTEM CTL
PICTURE CTL
IC2001 VCR0094
CAP SPEED DET
FG AMP
CAP FG AMP
CTL PULSE WAVE SHAPER
X2001 VSX0131
C2001 50V0.33
R2001 1800
R2081 1500
C2071 0.01
L2002 100μ
C2002 16V10
C2003 50V1
IC2002 AN3615K
50Hz PULSE GEN.
CAP. FG GEN.
DIV.
CTL SIG. AMP
HEAD SW PULSE GEN.
FG/PG PULSE GEN.
MODE SELECT
TRACKING
REF. PULSE GEN.
SKEW COMP.
CTL SIG. GEN.
CAP. PHA COMP.
CYL PHA COMP.
CTL SPEED COMP.
CAP SPEED COMP.
B.P.M
SP/SLP DET.
PG SHIFTER
TP2001
TP2002
TP2003
TP2004
TP2005
TP2006
C2007 0.022
R2002 5600
C2004 33P
C2005 0.0047
C2006 50V1
C2008 4V47
C2009 4V100
R2003 820
C2011 0.047
C2010 16V10
R2005 100K
R2004 27K
C2012 0.027
R2007 15K
(S0)
(S1)
(REC/PB/MEM)
(INS/NORMAL/ REC START)
(R/S/F)
(P.B LOADING)
R2022 56K
QR2007 UN2213 (INV.)
C2014 50V1
R2008 10K
R2009 56
R2010 56
R2012 33K
R2011 2700
C2015 6V100
C2016 6V100
C2017 0.047
R2013 120K
R2014 150K
R2017 150K
R2015 56K
R2016 330K
C2019 6V22
R2018 12K
C2021 0.047
C2022 0.0047
C2018 0.01
R2021 100K
TRACKING FIX
QR2001 UN2110 (CAPSTAN GAIN COMPEN.)
R2083 56K
C2073 0.027
Q2005 2SD1328
C2025 16V0.27
Q2001 2SB709 (CAPSTAN GAIN COMPEN.)
R2029 10K
R2030 4700
C2031 0.068
R2023 3300
C2027 50V0.47
R2025 22K
C2028 16V10
C2029 50V0.33
R2082 820K
R2026 22K
R2027 27K
R2028 3300
C2030 0.0033
R2031 220K
R2024 3300
IC2003 μPC1516CA
REF.V GEN.
COMPEN.
CAP. DRIVE VOLTAGE AMP
CYL. DRIVE VOLTAGE AMP
MODE COMPEN.
TAPE SPEED COMPEN.
R2034 100K
R2084 56K
R2088 56K
QR2004 UN2213 (CAPSTAN GAIN SELE
(CYL. ON)
C2032 0.0056
R2036 560K
D2002 MA151A
(SS)
R2035 150K
IC2004 AN3715S
ENVE
REC/PB/MEMORY
S0
S1
REV/STOP/FWD IN
REV/STOP/FWD OUT
HEAD AMP SW
ROTARY SW
CURRENT LIMIT
PHASE COMPENSATOR
1 H V DANCING
2H V DANCING
MM1
MM2
THRESHOLD
MM3
H.GATE
V.PULSE
6H
2H
H SWAY 3
2H
S2
H SW
F ADV
(F.ADV)
SLOW TRACKING CTL
TEST
INJ
CLOCK
VCC
CAP. FG1 IN
CAP. FG1 OUT
FILTER
CAP. FG2 IN
CAP. FG2 OUT
GND
SCHMITT 2
SCHMITT 1
FULL TORQUE
H SWAY 2
H SWAY 1
R2019 10K
C2020 6V22
C2070 50V1
C2024 6.3V100
R2020 2200
C2023 0.022
QR2002 UN2213 (CONTROL SIGNAL PROHIBITION)
(9V OFF)
R2049 3300
R2050 330K
R2051 270
C2037 16V0.
C2039 50V1
C2041 4V47
C2040 0.033
C2042 50V1
C2043 0.033
C2044 50V1
C2045 50V1
C2046 0.22
C2047 0.01
C2074 0.1
R2052 390K
R2054 56K
QR2006 UN2213 (H-PHASE COMPEN.)
C2048 0.012
D2005 MA151WK
R2053 68K
R2064 0.68
R2065 22K
C2061 0.1
R2066 3300
C2062 50V1
R2067 10K
R2068 2K
R2069 10K
CAPS. FREE RUN
C2063 4V47
IC2006 AN3821
RIPPLE CANCELLER
TORQUE CONTROL
HALL ELE.
POSITION SIGNAL PROCESS
3-DIFF. SWITCH
DIRECTION CONTROL
CAPSTAN MOTOR DRIVE
1st AMP
R2087 10K
(REC/PB/MEM)
(S0)
(S1)
(R/F/S)
R2076 56K
D2006 MA151WK
R2078 47K
R2079 47K
C2033 1000P
Q2004 2SD601 (HEAD AMP SELECT)
R2077 470K
QR2003 UN2212 (V-PHASE COMPEN.)
R2085 100K
R2043 100K
R2046 82K
R2045 82K
R2040 27K
R2042 15K
R2089 0
C2035 0.0068
C2034 0.0033
C2036 0.0056
R2047 10K
R2048 100K
V-DANCE

ED LOOP ◀━━━ CYLINDER SERVO PHASE LOOP

D LOOP ◀■ ■ ■ ■ CAPSTAN SERVO PHASE LOOP

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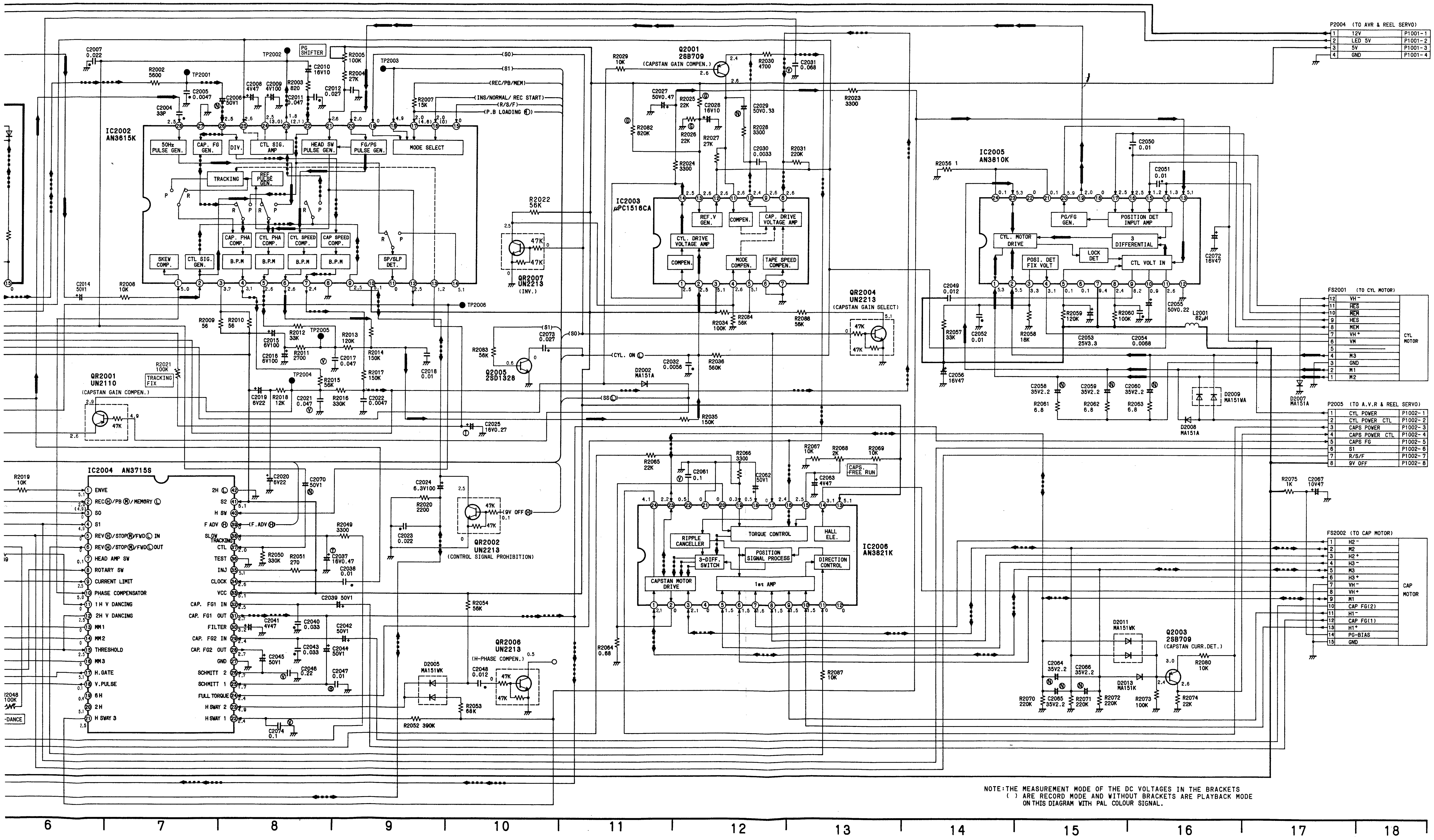
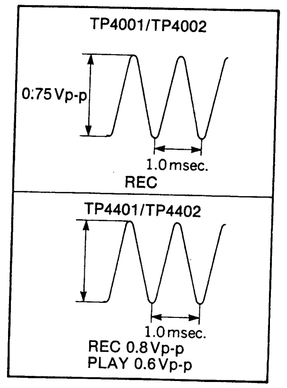

IC2002 AN3615K
50Hz PULSE GEN.
CAP. FG GEN.
DIV.
CTL SIG. AMP
HEAD SW PULSE GEN.
FG/PG PULSE GEN.
MODE SELECT
TRACKING
REF PULSE GEN.
CAP. PHA COMP.
CYL PHA COMP.
CYL SPEED COMP.
CAP SPEED COMP.
SKEW COMP.
CTL SIG. GEN.
B.P.M
SP/SLP DET.
PG SHIFTER
TP2001
TP2002
TP2003
TP2004
TP2005
TP2006
QR2001 UN2110 (CAPSTAN GAIN COMPEN.)
TRACKING FIX
QR2007 UN2213 (INV.)
Q2005 2SD1328
Q2001 2SB709 (CAPSTAN GAIN COMPEN.)
IC2003 μPC1516CA
REF.V GEN.
COMPEN.
CAP. DRIVE VOLTAGE AMP
CYL. DRIVE VOLTAGE AMP
MODE COMPEN.
TAPE SPEED COMPEN.
QR2004 UN2213 (CAPSTAN GAIN SELECT)
IC2005 AN3810K
PG/FG GEN.
POSITION DET INPUT AMP
CYL. MOTOR DRIVE
3 DIFFERENTIAL
LOCK DET
POSI. DET FIX VOLT
CTL VOLT IN
P2004 (TO AVR & REEL SERVO)
12V P1001-1
LED 5V P1001-2
5V P1001-3
GND P1001-4
FS2001 (TO CYL MOTOR)
CYL MOTOR
D2009 MA151WA
D2008 MA151A
D2007 MA151A
P2005 (TO A.V.R & REEL SERVO)
CYL POWER P1002-1
CYL POWER CTL P1002-2
CAPS POWER P1002-3
CAPS POWER CTL P1002-4
CAPS FG P1002-5
S1 P1002-6
R/S/F P1002-7
9V OFF P1002-8
FS2002 (TO CAP MOTOR)
CAP MOTOR
IC2004 AN3715S
ENVE
REC(H)/PB(H)/MEMORY(L)
S0
S1
REV(H)/STOP(H)/FWD(L) IN
REV(H)/STOP(H)/FWD(L) OUT
HEAD AMP SW
ROTARY SW
CURRENT LIMIT
PHASE COMPENSATOR
1H V DANCING
2H V DANCING
MM1
MM2
THRESHOLD
MM3
H.GATE
V.PULSE
6H
2H
H SWAY 3
QR2002 UN2213 (CONTROL SIGNAL PROHIBITION)
QR2006 UN2213 (H-PHASE COMPEN.)
D2005 MA151WK
IC2006 AN3821K
RIPPLE CANCELLER
TORQUE CONTROL
HALL ELE.
3-DIFF. SWITCH
POSITION SIGNAL PROCESS
DIRECTION CONTROL
CAPSTAN MOTOR DRIVE
1st AMP
CAPS. FREE RUN
D2011 MA151WK
Q2003 2SB709 (CAPSTAN CURR.DET.)
D2013 MA151K
(REC/PB/MEM)
(INS/NORMAL/ REC START)
(R/S/F)
(P.B LOADING)
(CYL. ON)
(9V OFF)
(F.ADV)
6 7 8 9 10 11 12 13 14 15 16 17 18

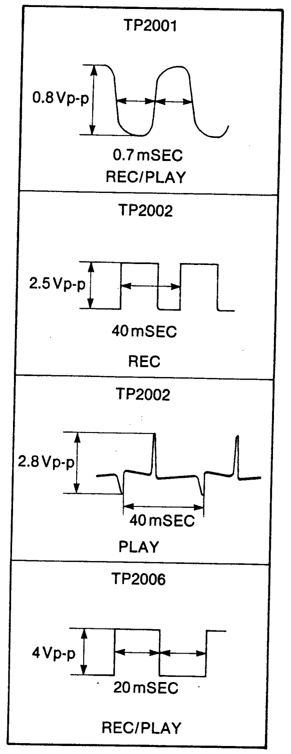
NOTE:THE MEASUREMENT MODE OF THE DC VOLTAGES IN THE BRACKETS ( ) ARE RECORD MODE AND WITHOUT BRACKETS ARE PLAYBACK MODE ON THIS DIAGRAM WITH PAL COLOUR SIGNAL.

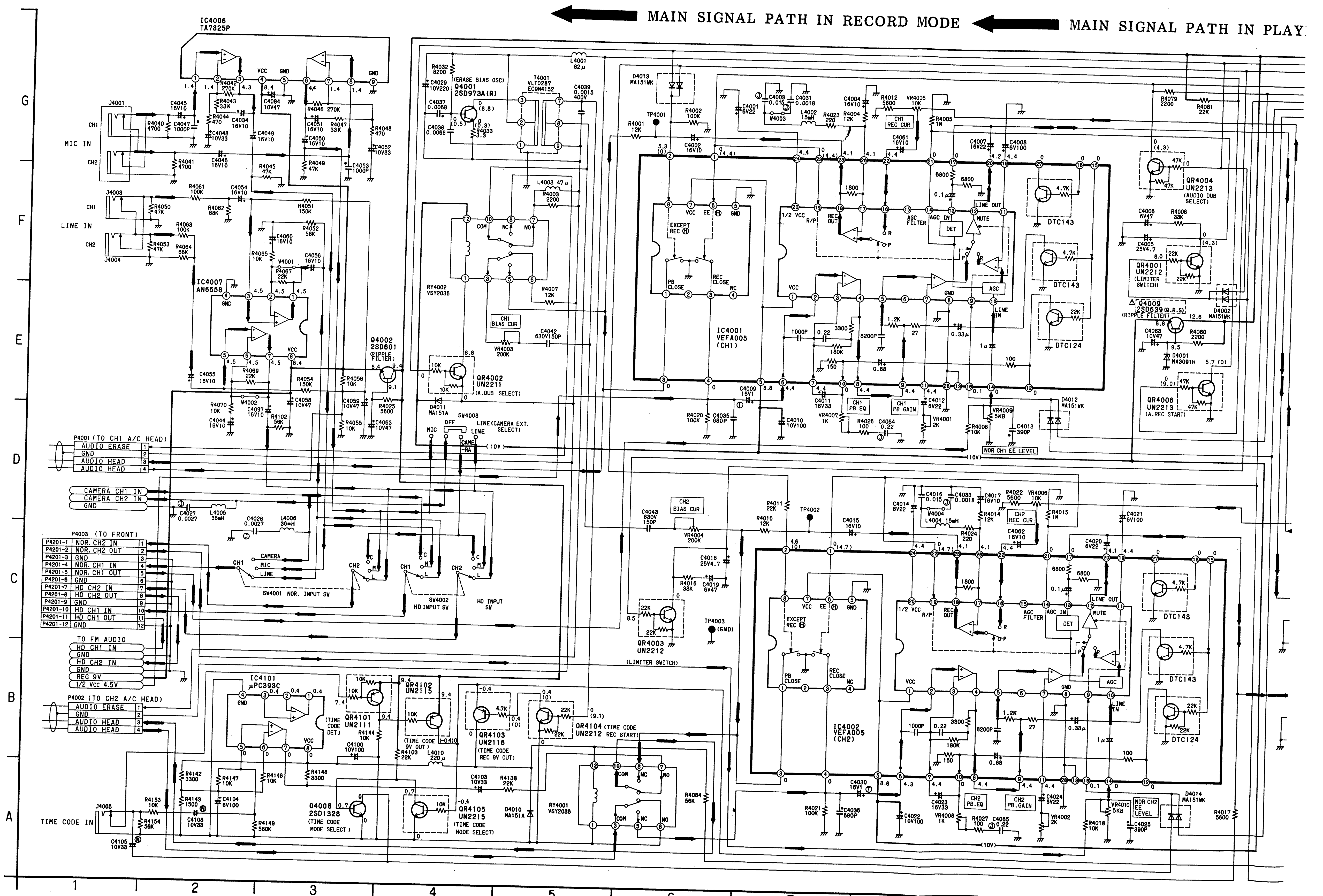
NORMAL AUDIO SCHEMATIC DIAGRAM

NORMAL AUDIO



SERVO



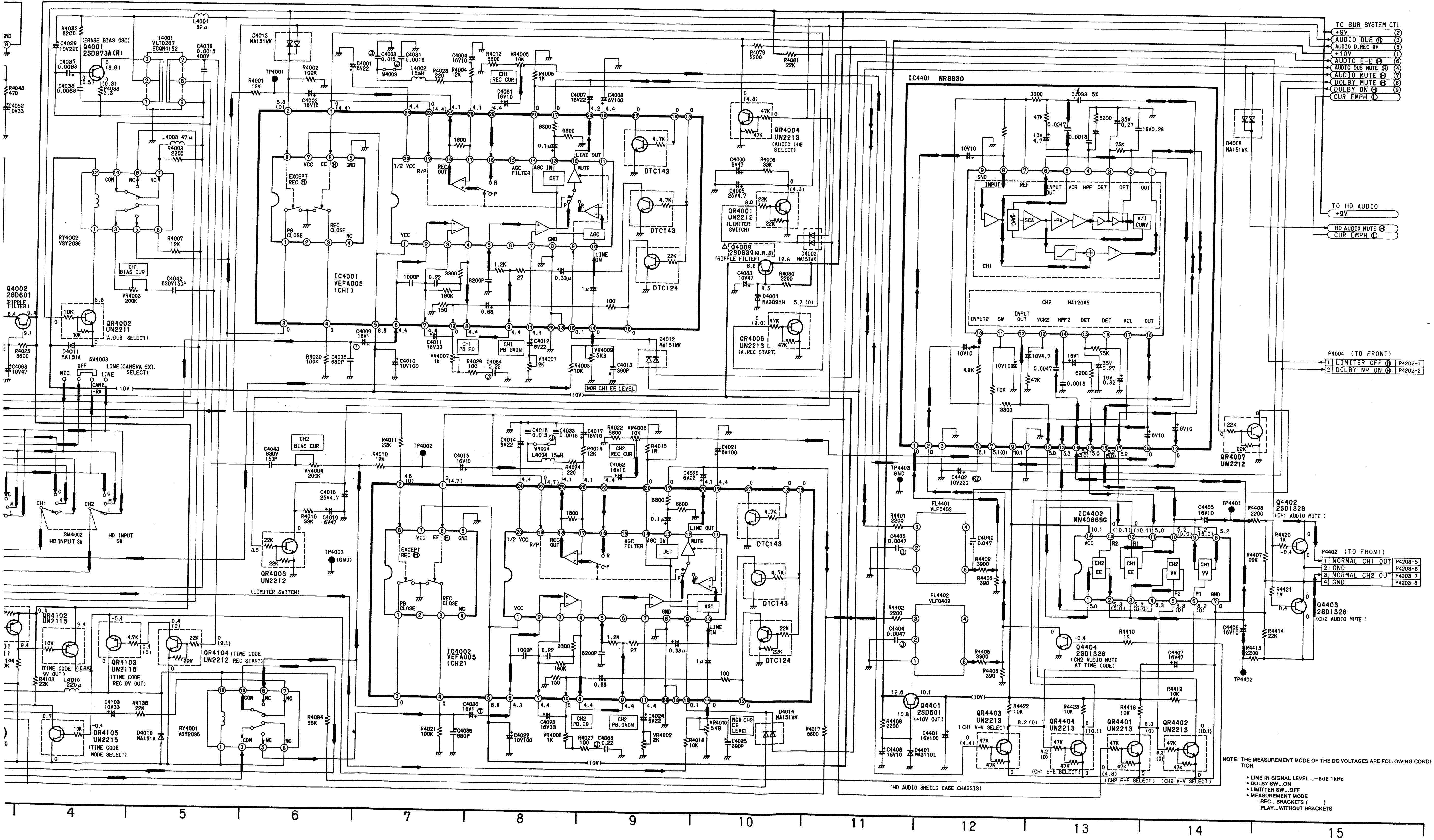

MAIN SIGNAL PATH IN RECORD MODE
MAIN SIGNAL PATH IN PLAY
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
IC4006
TA7325P
VCC
GND
J4001
CH1
MIC IN
CH2
J4003
LINE IN
J4004
IC4007
AN6558
Q4001
2SD973A(R)
(ERASE BIAS OSC)
T4001
VLT0287
ECOM4152
L4001
82μ
RY4002
VSY2036
CH1
BIAS CUR
VR4003
200K
Q4002
2SD601
(RIPPLE FILTER)
QR4002
UN2211
(A.DUB SELECT)
D4011
MA151A
SW4003
MIC
OFF
LINE
LINE(CAMERA EXT. SELECT)
CAMERA
(10V)
P4001 (TO CH1 A/C HEAD)
AUDIO ERASE
GND
AUDIO HEAD
AUDIO HEAD
CAMERA CH1 IN
CAMERA CH2 IN
GND
P4003 (TO FRONT)
P4201-1 NOR. CH2 IN
P4201-2 NOR. CH2 OUT
P4201-3 GND
P4201-4 NOR. CH1 IN
P4201-5 NOR. CH1 OUT
P4201-6 GND
P4201-7 HD CH2 IN
P4201-8 HD CH2 OUT
P4201-9 GND
P4201-10 HD CH1 IN
P4201-11 HD CH1 OUT
P4201-12 GND
SW4001 NOR. INPUT SW
SW4002
HD INPUT SW
HD INPUT SW
TO FM AUDIO
HD CH1 IN
GND
HD CH2 IN
GND
REG 9V
1/2 VCC 4.5V
P4002 (TO CH2 A/C HEAD)
AUDIO ERASE
GND
AUDIO HEAD
AUDIO HEAD
J4005
TIME CODE IN
IC4101
μPC393C
QR4101
UN2111
(TIME CODE DET)
QR4102
UN2115
QR4103
UN2116
(TIME CODE REC 9V OUT)
QR4104 (TIME CODE
UN2212 REC START)
Q4008
2SD1328
(TIME CODE MODE SELECT)
QR4105
UN2215
(TIME CODE MODE SELECT)
D4010
MA151A
RY4001
VSY2036
D4013
MA151WK
TP4001
IC4001
VEFA005
(CH1)
EXCEPT REC
PB CLOSE
REC CLOSE
1/2 VCC
R/P
REC OUT
AGC FILTER
AGC IN
DET
MUTE
LINE OUT
AGC
LINE IN
CH1 REC CUR
CH1 PB EQ
CH1 PB GAIN
DTC143
DTC143
DTC124
QR4004
UN2213
(AUDIO DUB SELECT)
QR4001
UN2212
(LIMITER SWITCH)
Q4009
2SD639(Q,R,S)
(RIPPLE FILTER)
D4002
MA151WK
D4001
MA3091H
QR4006
UN2213
(A.REC START)
D4012
MA151WK
NOR CH1 EE LEVEL
CH2
BIAS CUR
VR4004
200K
TP4002
QR4003
UN2212
(LIMITER SWITCH)
TP4003
(GND)
IC4002
VEFA005
(CH2)
CH2 REC CUR
CH2 PB.EQ
CH2 PB.GAIN
DTC143
DTC143
DTC124
NOR CH2 EE LEVEL
D4014
MA151WK

AGRAM

MAIN SIGNAL PATH IN RECORD MODE

MAIN SIGNAL PATH IN PLAYBACK MODE

NOTE: DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST. AND MAY BE SLIGHTLY DIFFERENT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

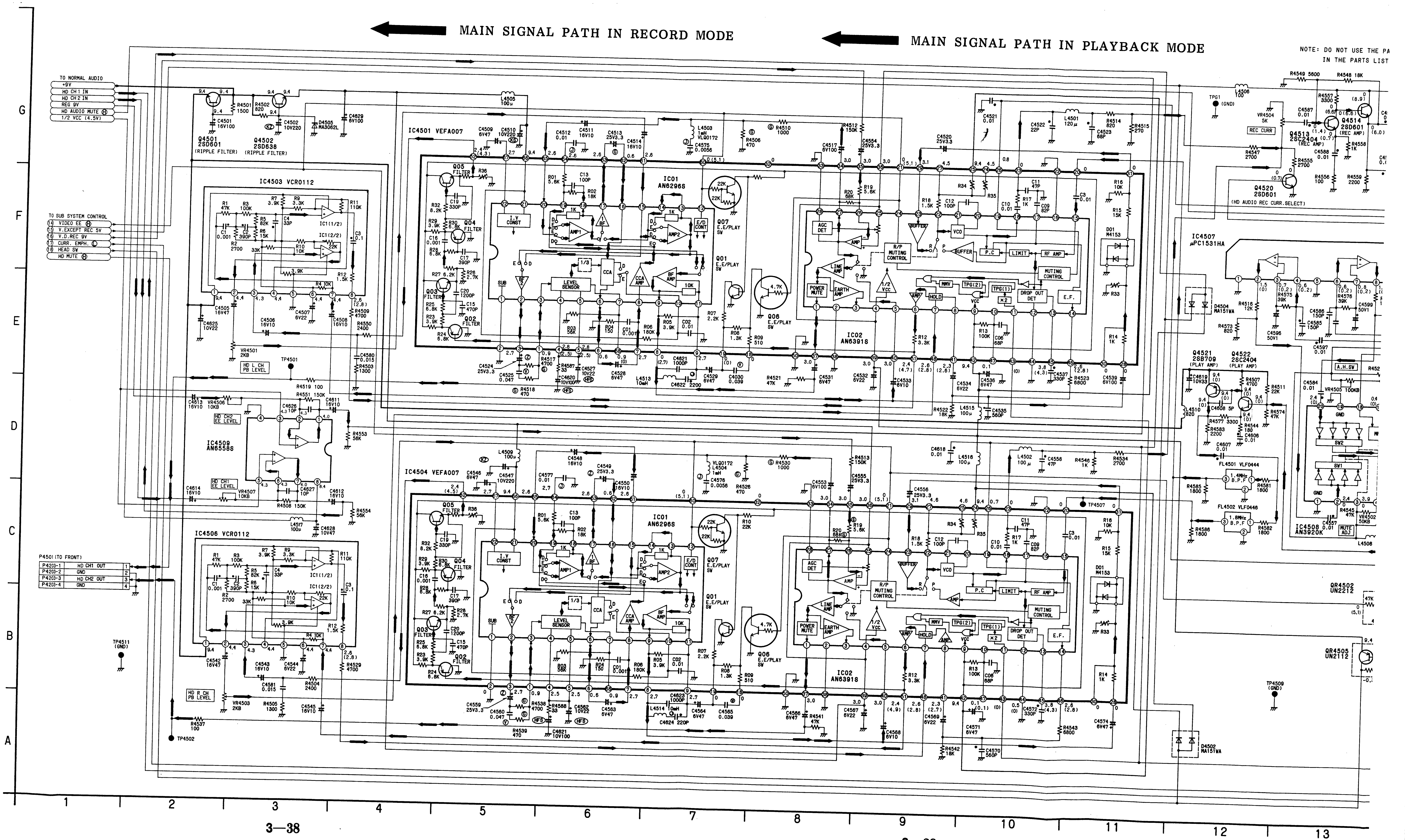

IC4001 VEFA005 (CH1)
IC4002 VEFA005 (CH2)
IC4401 NR8830
IC4402 MN4066BG
CH2 HA12045
Q4001 2SD973A(R)
(ERASE BIAS OSC)
T4001 VLT0287 ECQM4152
L4001 82μ
RY4002 VSY2036
RY4001 VSY2036
Q4002 2SD601 (RIPPLE FILTER)
QR4002 UN2211 (A.DUB SELECT)
D4011 MA151A
SW4003
MIC
OFF
LINE
LINE(CAMERA EXT. SELECT)
CAMERA
(10V)
SW4002 HD INPUT SW
HD INPUT SW
CH1
CH2
QR4003 UN2212
(LIMITER SWITCH)
QR4102 UN2115
QR4103 UN2116 (TIME CODE REC 9V OUT)
QR4104 UN2212 (TIME CODE REC START)
QR4105 UN2215 (TIME CODE MODE SELECT)
D4010 MA151A
CH1 BIAS CUR
CH2 BIAS CUR
D4013 MA151WK
D4012 MA151WK
D4014 MA151WK
TP4001
TP4002
TP4003 (GND)
CH1 REC CUR
CH2 REC CUR
CH1 PB EQ
CH1 PB GAIN
CH2 PB.EQ
CH2 PB.GAIN
NOR CH1 EE LEVEL
NOR CH2 EE LEVEL
EXCEPT REC Ⓗ
PB CLOSE
REC CLOSE
1/2 VCC
R/P
REC OUT
AGC FILTER
AGC IN
DET
LINE OUT
MUTE
AGC
LINE IN
VCC
EE Ⓗ
GND
DTC143
DTC124
QR4004 UN2213 (AUDIO DUB SELECT)
QR4001 UN2212 (LIMITER SWITCH)
Q4009 2SD639(Q.R.S) (RIPPLE FILTER)
D4001 MA3091H
D4002 MA151WK
QR4006 UN2213 (A.REC START)
D4008 MA151WK
INPUT
REF
OUT
VCR HPF
DET
SCA
HPA
V/I CONV
INPUT2
SW
VCR2
HPF2
TO SUB SYSTEM CTL
+9V
AUDIO DUB Ⓗ
AUDIO D.REC 9V
+10V
AUDIO E-E Ⓗ
AUDIO DUB MUTE Ⓗ
AUDIO MUTE Ⓗ
DOLBY MUTE Ⓗ
DOLBY ON Ⓗ
CUR EMPH Ⓛ
TO HD AUDIO
HD AUDIO MUTE Ⓗ
P4004 (TO FRONT)
1 LIMITER OFF Ⓗ P4202-1
2 DOLBY NR ON Ⓗ P4202-2
QR4007 UN2212
TP4403 GND
FL4401 VLF0402
FL4402 VLF0402
Q4402 2SD1328 (CH1 AUDIO MUTE)
Q4403 2SD1328 (CH2 AUDIO MUTE)
Q4404 2SD1328 (CH2 AUDIO MUTE AT TIME CODE)
P4402 (TO FRONT)
1 NORMAL CH1 OUT P4203-5
2 GND P4203-6
3 NORMAL CH2 OUT P4203-7
4 GND P4203-8
TP4401
TP4402
Q4401 2SD601 (+10V OUT)
D4401 MA3110L
QR4403 UN2213 (CH1 V-V SELECT)
QR4404 UN2213 (CH1 E-E SELECT)
QR4401 UN2213 (CH2 E-E SELECT)
QR4402 UN2213 (CH2 V-V SELECT)
(HD AUDIO SHEILD CASE CHASSIS)
4
5
6
7
8
9
10
11
12
13
14
15

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGES ARE FOLLOWING CONDITION.

- LINE IN SIGNAL LEVEL... −8dB 1kHz
- DOLBY SW...ON
- LIMITTER SW...OFF
- MEASUREMENT MODE
  - REC...BRACKETS (   )
  - PLAY...WITHOUT BRACKETS

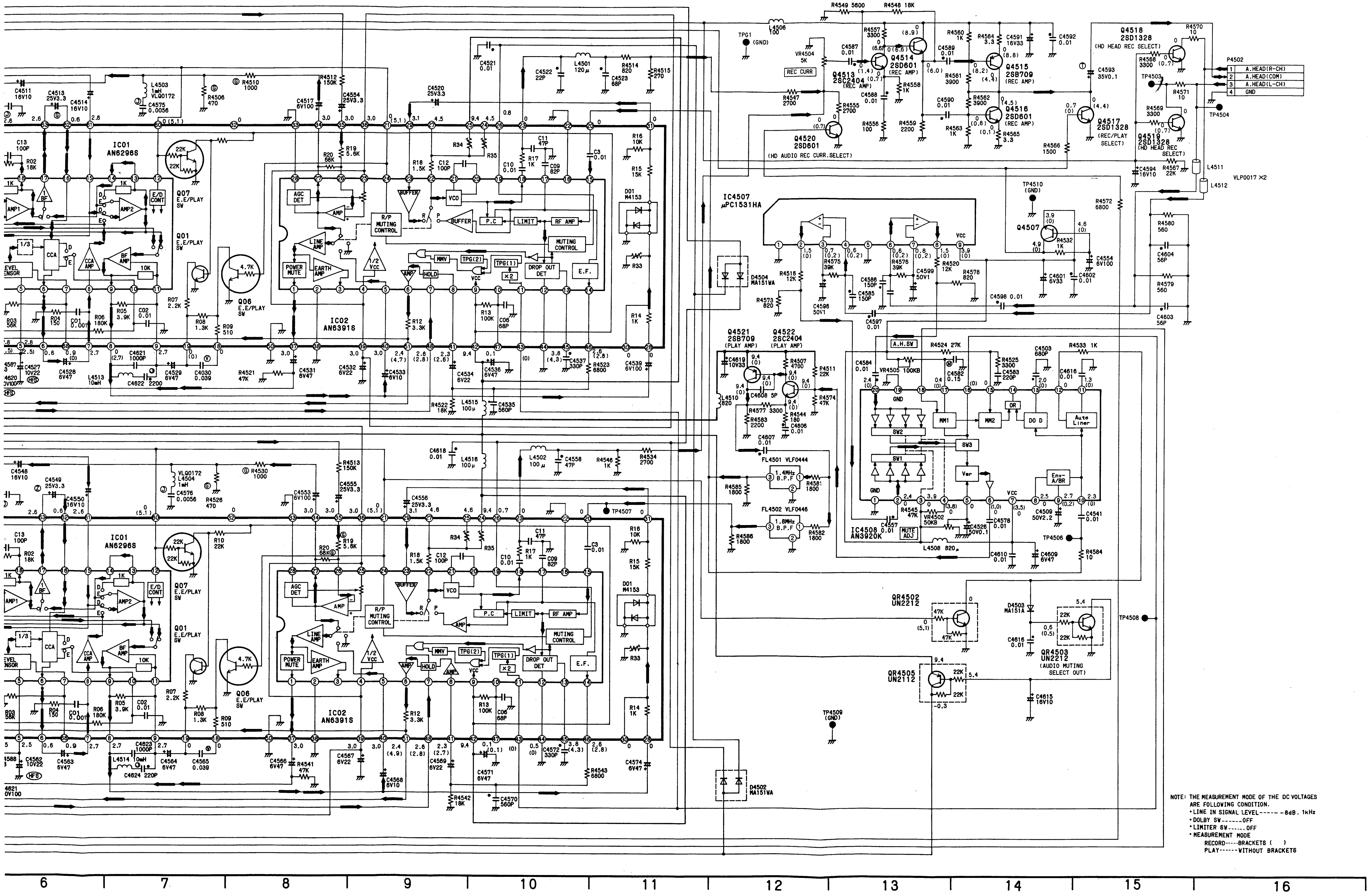
HD AUDIO SCHEMATIC DIAGRAM

NOTE: DO NOT USE THE PA
IN THE PARTS LIST

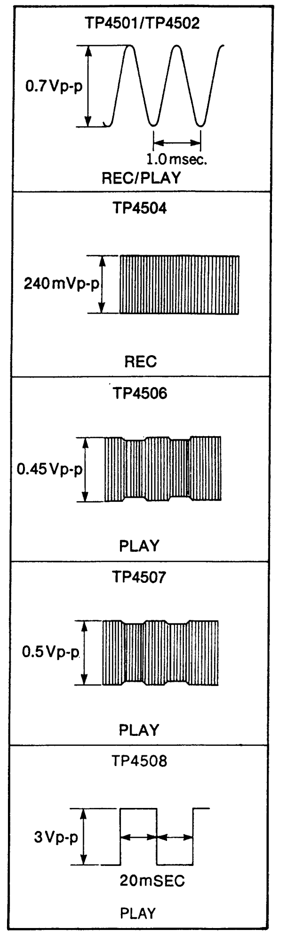

MAIN SIGNAL PATH IN RECORD MODE
MAIN SIGNAL PATH IN PLAYBACK MODE
TO NORMAL AUDIO
+9V
HD CH1 IN
HD CH2 IN
REG 9V
HD AUDIO MUTE Ⓗ
1/2 VCC (4.5V)
TO SUB SYSTEM CONTROL
⑭ VIDEO EE Ⓔ
⑮ V.EXCEPT REC 5V
⑯ V.D.REC 9V
⑰ CURR. EMPH. Ⓒ
⑱ HEAD SW
HD MUTE Ⓗ
P4501 (TO FRONT)
P4203-1 HD CH1 OUT
P4203-2 GND
P4203-3 HD CH2 OUT
P4203-4 GND
Q4501 2SD601 (RIPPLE FILTER)
Q4502 2SD638 (RIPPLE FILTER)
D4505 MA3062L
IC4503 VCR0112
IC4506 VCR0112
IC4509 AN6558S
IC4501 VEFA007
IC4504 VEFA007
IC01 AN6296S
IC02 AN6391S
Q01 E.E/PLAY SW
Q02 FILTER
Q03 FILTER
Q04 FILTER
Q05 FILTER
Q06 E.E/PLAY SW
Q07 E.E/PLAY SW
HD L CH PB LEVEL
HD R CH PB LEVEL
HD CH2 EE LEVEL
HD CH1 EE LEVEL
TP4501
TP4502
TP4507
TP4509 (GND)
TP4511 (GND)
TPG1 (GND)
REC CURR
Q4513 2SC2404 (REC AMP)
Q4514 2SD601 (REC AMP)
Q4520 2SD601 (HD AUDIO REC CURR.SELECT)
IC4507 µPC1531HA
Q4521 2SB709 (PLAY AMP)
Q4522 2SC2404 (PLAY AMP)
D4504 MA151WA
D4502 MA151WA
FL4501 VLF0444 1.4MHz B.P.F
FL4502 VLF0446 1.8MHz B.P.F
IC4508 AN3920K
A.H.SW
SW1
SW2
MUTE ADJ
QR4502 UN2212
QR4505 UN2112
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13

ATH IN RECORD MODE ◀ MAIN SIGNAL PATH IN PLAYBACK MODE

NOTE: DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST. AND MAY BE SLIGHTLY DIFFERENT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

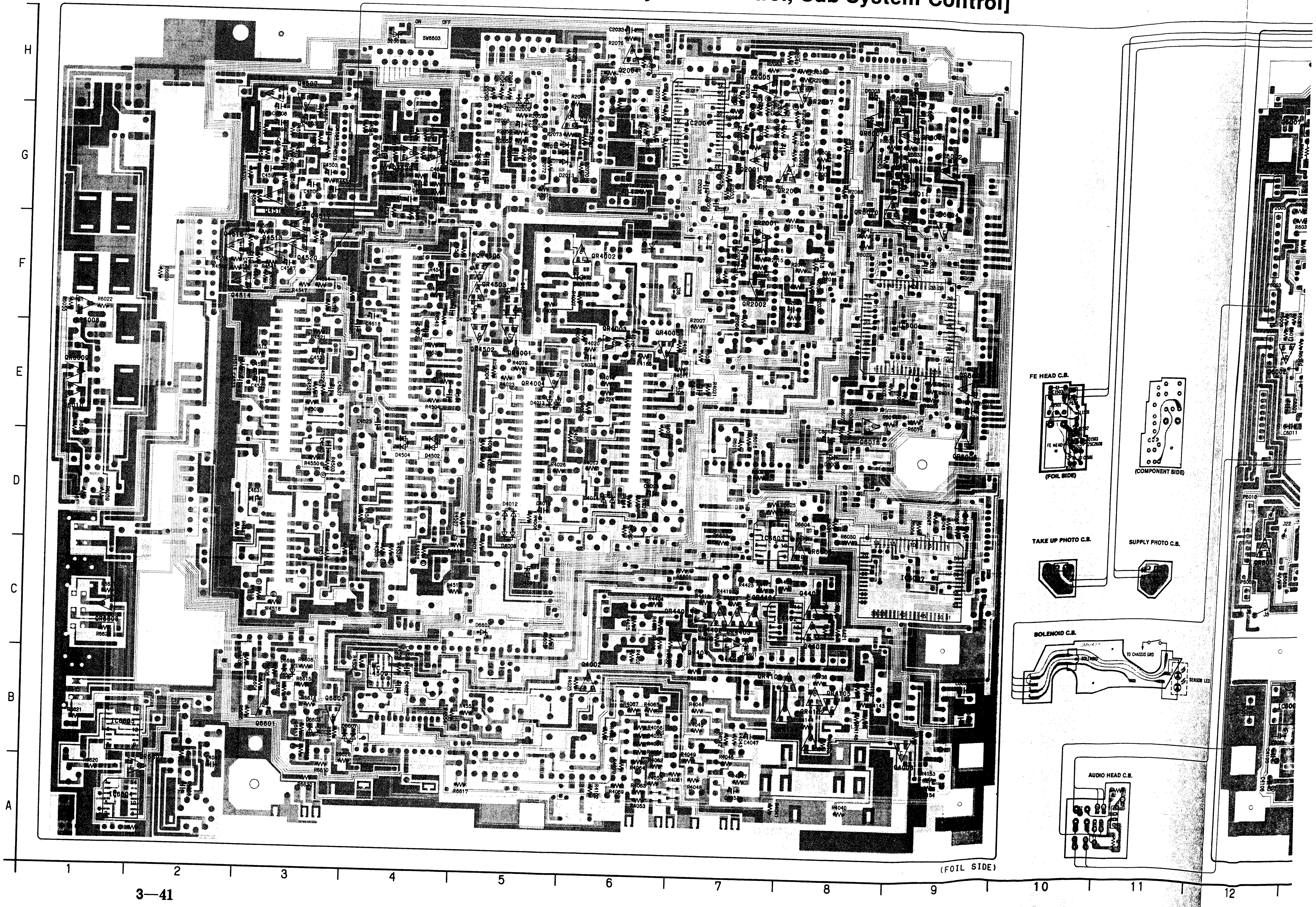

IC01 AN6296S
IC02 AN6391S
IC4507 μPC1531HA
IC4508 AN3920K
Q4513 2SC2404 (REC AMP)
Q4514 2SD601 (REC AMP)
Q4515 2SB709 (REC AMP)
Q4516 2SD601 (REC AMP)
Q4517 2SD1328 (REC/PLAY SELECT)
Q4518 2SD1328 (HD HEAD REC SELECT)
Q4519 2SD1328 (HD HEAD REC SELECT)
Q4520 2SD601 (HD AUDIO REC CURR.SELECT)
Q4521 2SB709 (PLAY AMP)
Q4522 2SC2404 (PLAY AMP)
Q4507
QR4502 UN2212
QR4503 UN2212 (AUDIO MUTING SELECT OUT)
QR4505 UN2112
D4502 MA151WA
D4503 MA151A
D4504 MA151WA
FL4501 VLF0444 1.4MHz B.P.F
FL4502 VLF0446 1.8MHz B.P.F
P4502
A.HEAD(R-CH)
A.HEAD(COM)
A.HEAD(L-CH)
GND
VLP0017 ×2
TPG1 (GND)
TP4503
TP4504
TP4506
TP4507
TP4508
TP4509 (GND)
TP4510 (GND)
REC CURR
A.H.SW
MUTE ADJ
6
7
8
9
10
11
12
13
14
15
16

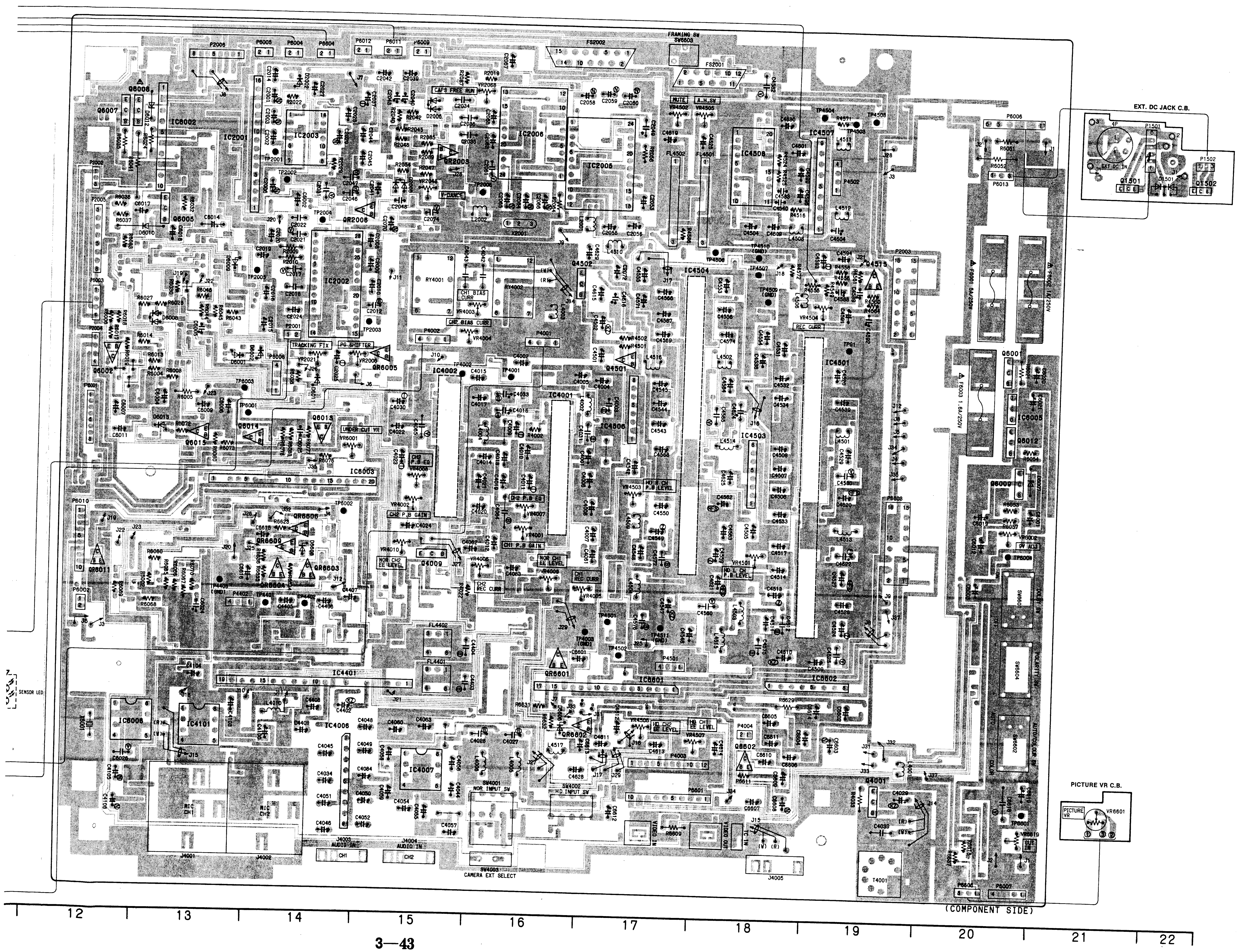
HD AUDIO

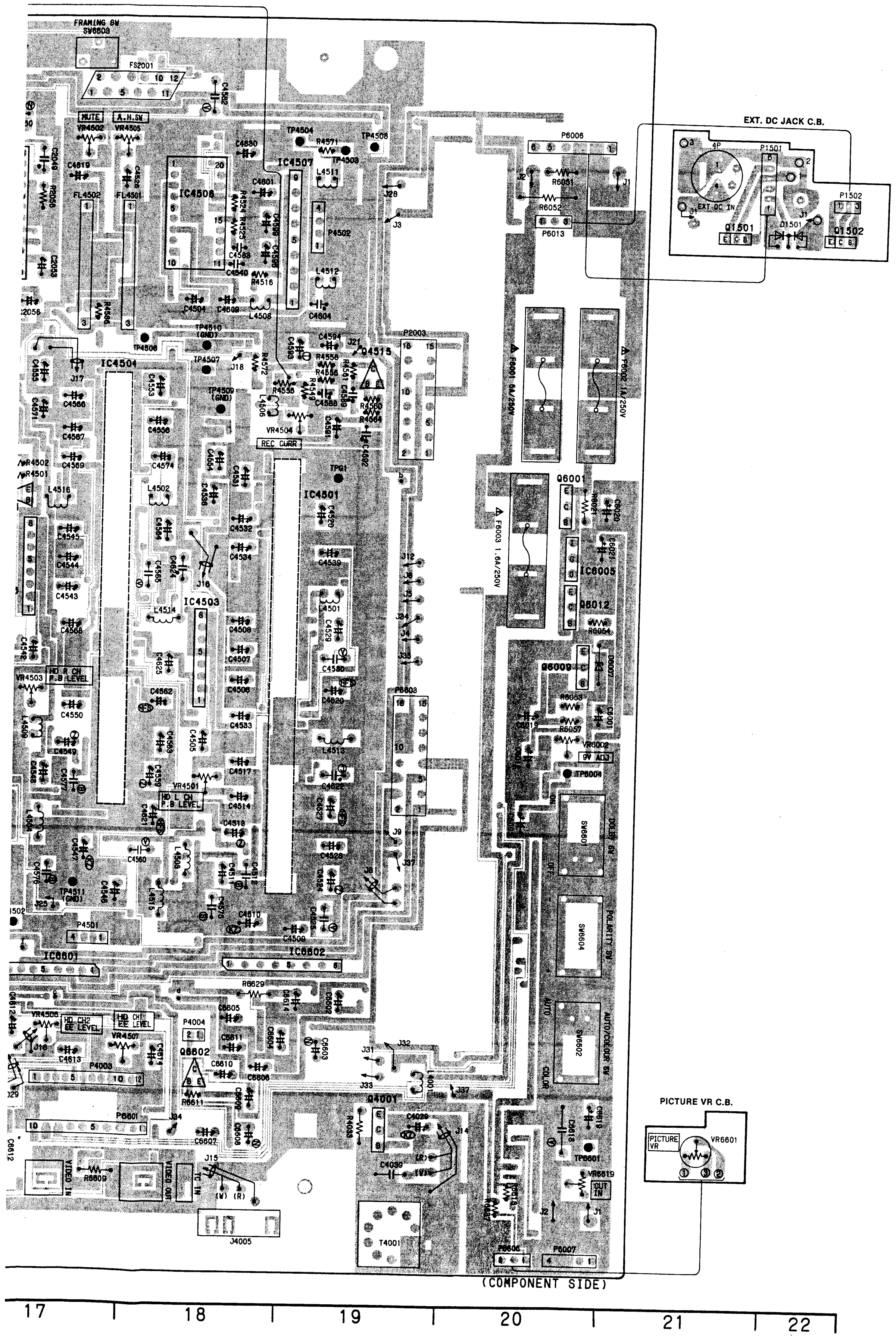


NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGES ARE FOLLOWING CONDITION.
- LINE IN SIGNAL LEVEL------ -8dB, 1kHz
- DOLBY SW------OFF
- LIMITER SW------OFF
- MEASUREMENT MODE
  RECORD----BRACKETS ( )
  PLAY------WITHOUT BRACKETS

MAIN C.B.A. (VEP04177A), [Normal Audio, HD Audio, Servo, System Control, Sub-System Control]


H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
(FOIL SIDE)
FE HEAD C.B.
(FOIL SIDE)
(COMPONENT SIDE)
TAKE UP PHOTO C.B.
SUPPLY PHOTO C.B.
SOLENOID C.B.
TO CHASSIS GND
SENSOR LED
AUDIO HEAD C.B.
ON
OFF
SW6603

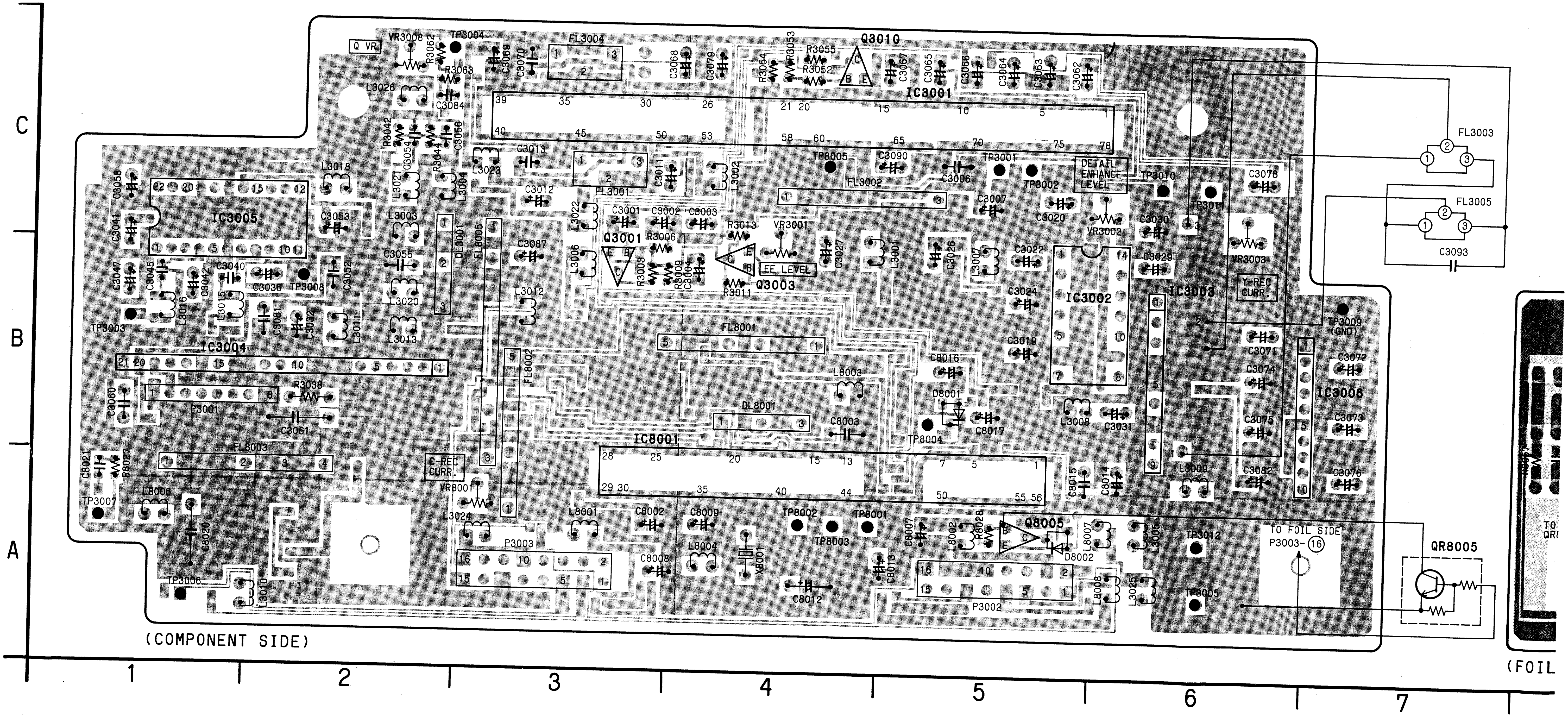
EXT. DC JACK C.B.
PICTURE VR C.B.
SENSOR LED
(COMPONENT SIDE)
FRAMING SW
CAPS FREE RUN
MUTE
A.H.SW
TRACKING FIX
PG SHIFTER
UNDER CUT VR
CH1 BIAS CURR
CH2 BIAS CURR
REC CURR
CH2 P.B EQ
CH1 P.B EQ
CH2 P.B GAIN
CH1 P.B GAIN
NOR CH2 EE LEVEL
NOR CH1 EE LEVEL
CH1 REC CURR
CH2 REC CURR
HD R CH P.B LEVEL
HD L CH P.B LEVEL
HD CH2 EE LEVEL
HD CH1 EE LEVEL
NOR INPUT SW
HD INPUT SW
CAMERA EXT SELECT
AUDIO IN
CH1
CH2
MIC CH1
MIC CH2
VIDEO IN
VIDEO OUT
9V ADJ
DOLBY SW
POLARITY SW
AUTO/COLOR SW
COLOR
PICTURE VR
IC2001
IC2002
IC2003
IC2005
IC2006
IC4001
IC4002
IC4006
IC4007
IC4101
IC4401
IC4501
IC4503
IC4504
IC4506
IC4507
IC4508
IC6002
IC6003
IC6005
IC6008
IC6601
IC6602
F6001 1.6A/250V
F6002 1.6A/250V
F6003 1.6A/250V
12
13
14
15
16
17
18
19
20
21
22

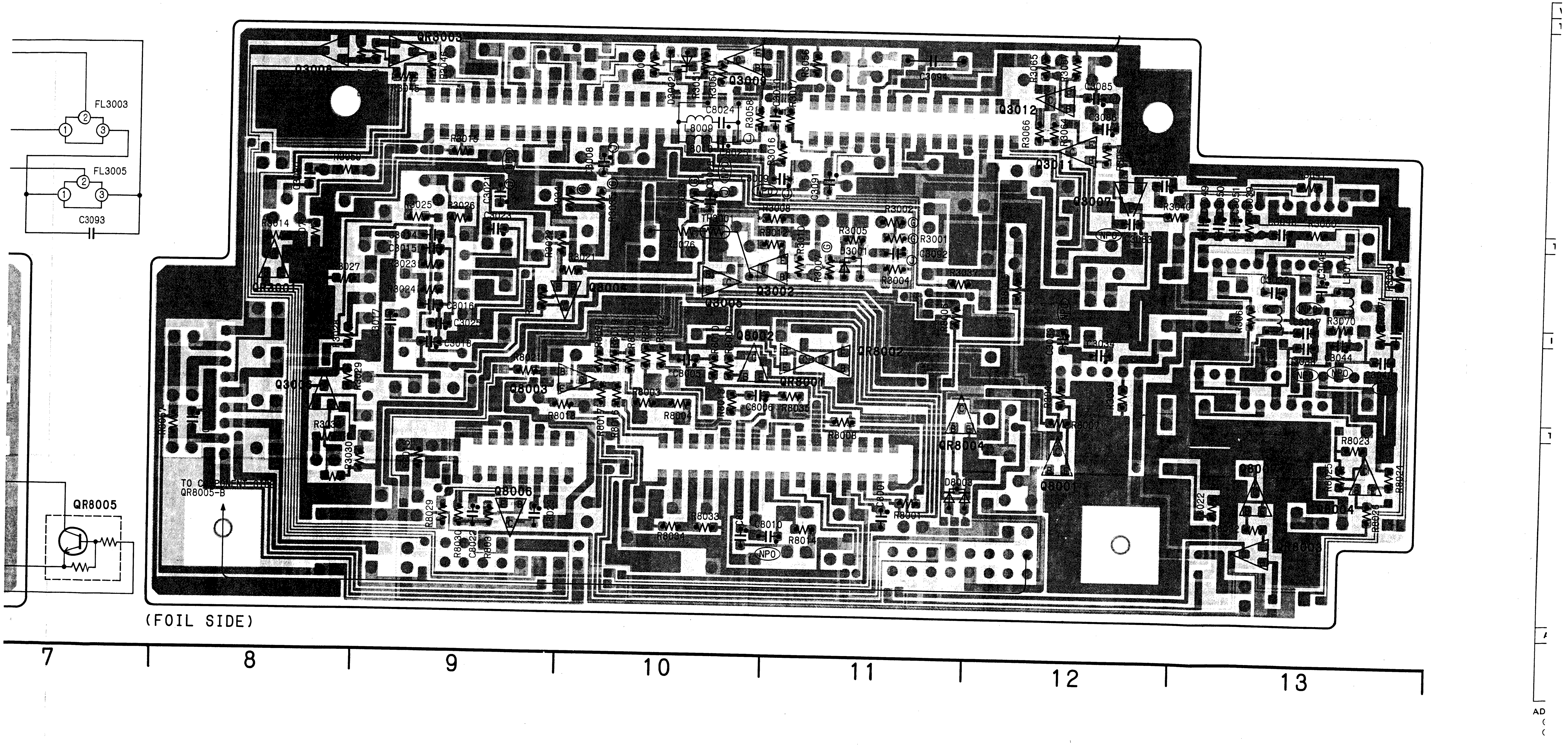

FRAMING SW
SV6608
EXT. DC JACK C.B.
EXT. DC IN
P1501
P1502
Q1501
Q1502
D1501
IC4504
IC4501
IC4503
IC4505
IC4507
IC4508
IC6601
IC6602
IC6005
Q6001
Q6012
Q4515
Q4001
Q6602
REC CURR
HD R CH
P.B LEVEL
HD L CH
P.B LEVEL
SW6601
SW6604
SW6602
DOLBY SW
POLARITY SW
AUTO/COLOUR SW
9V ADJ
PICTURE VR C.B.
PICTURE VR
VR6601
T4001
J4005
(COMPONENT SIDE)
17
18
19
20
21
22

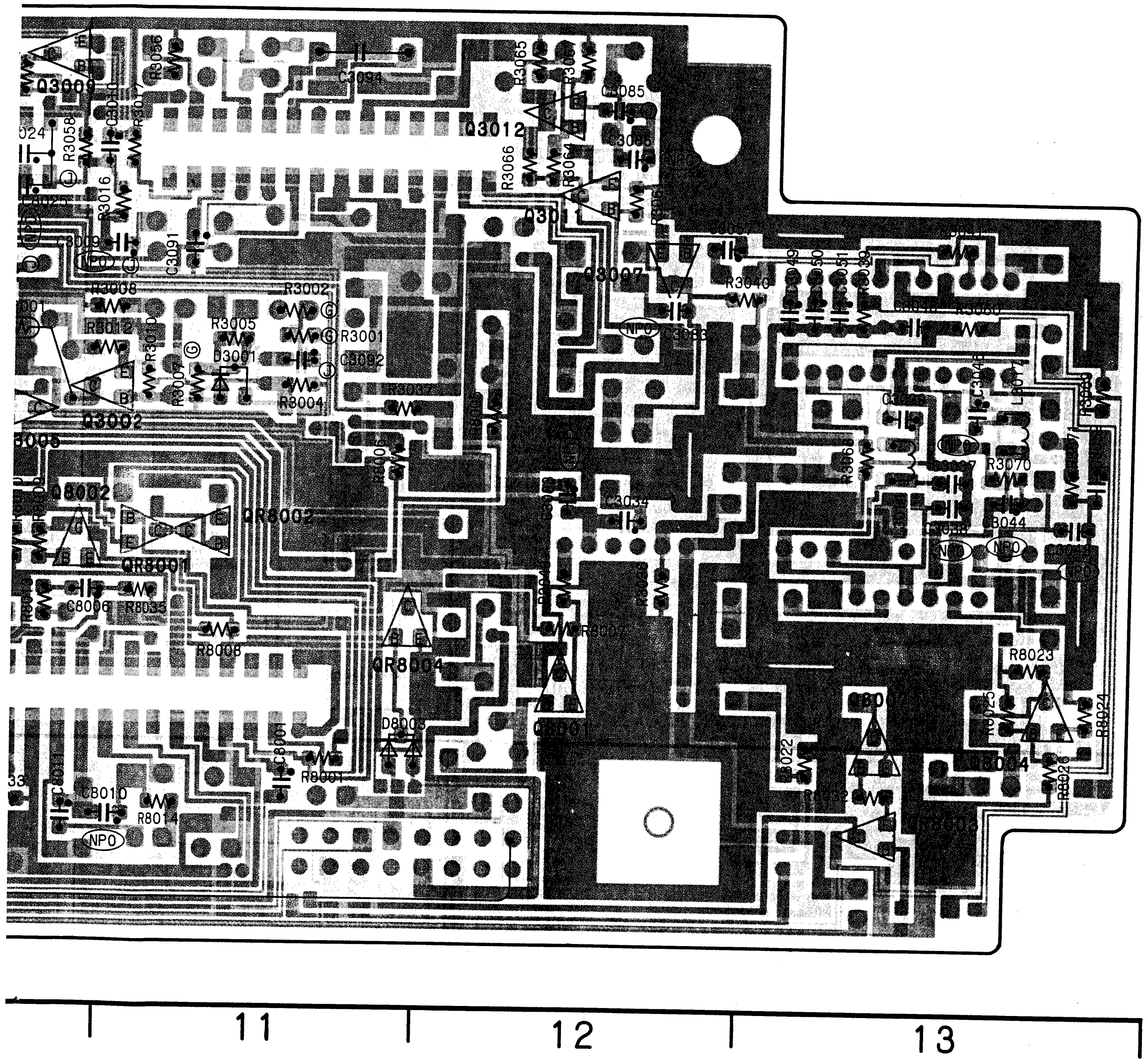
MAIN C.B.A.	
Servo Section	
Transistors	
Q2001	G-7 Ⓕ
Q2003	G-5 Ⓕ
Q2004	H-6 Ⓕ
Q2005	H-7 Ⓕ
Transistors & Resistors	
QR2001	F-7 Ⓕ
QR2002	F-7 Ⓕ
QR2003	G-15 Ⓒ
QR2004	G-7 Ⓕ
QR2006	G-14 Ⓒ
QR2007	H-8 Ⓕ
Integrated Circuits	
IC2001	G-13 Ⓒ
IC2002	F-14 Ⓒ
IC2003	G-14 Ⓒ
IC2004	G-7 Ⓕ
IC2005	G-17 Ⓒ
IC2006	G-16 Ⓒ
Test Points	
TP2001	G-14 Ⓒ
TP2002	G-14 Ⓒ
TP2003	F-15 Ⓒ
TP2004	G-14 Ⓒ
TP2005	F-14 Ⓒ
TP2006	G-16 Ⓒ
Adjustments	
VR2005	E-15 Ⓒ
VR2021	E-14 Ⓒ
VR2048	G-15 Ⓒ
VR2068	H-16 Ⓒ
Normal Audio Section	
Transistors	
Q4001	B-19 Ⓒ
Q4002	B-6 Ⓕ
Q4008	B-9 Ⓕ
Q4009	D-15 Ⓒ
Q4401	C-7 Ⓕ
Q4402	C-8 Ⓕ
Q4403	C-8 Ⓕ
Q4404	C-7 Ⓕ
Transistors & Resistors	
QR4001	E-5 Ⓕ
QR4002	F-6 Ⓕ
QR4003	E-6 Ⓕ
QR4004	E-5 Ⓕ
QR4006	E-6 Ⓕ
QR4101	B-8 Ⓕ
QR4102	B-8 Ⓕ
QR4103	B-8 Ⓕ
QR4104	B-8 Ⓕ
QR4105	B-8 Ⓕ
QR4401	C-7 Ⓕ
QR4402	C-7 Ⓕ
QR4403	C-7 Ⓕ
QR4404	C-7 Ⓕ
Integrated Circuits	
IC4001	E-16 Ⓒ
IC4002	E-15 Ⓒ
IC4006	B-14 Ⓒ
IC4007	B-15 Ⓒ
IC4101	B-13 Ⓒ
IC4401	C-14 Ⓒ
IC4402	C-8 Ⓕ
Test Points	
TP4001	E-16 Ⓒ
TP4002	E-15 Ⓒ
TP4003	C-17 Ⓒ
TP4401	C-14 Ⓒ
TP4402	C-14 Ⓒ
TP4403	C-13 Ⓒ
Adjustments	
VR4001	D-16 Ⓒ
VR4002	D-15 Ⓒ
VR4003	F-15 Ⓒ
VR4004	F-15 Ⓒ
VR4005	C-17 Ⓒ
VR4006	D-16 Ⓒ
VR4007	D-16 Ⓒ
VR4008	D-15 Ⓒ
VR4009	D-16 Ⓒ
VR4010	D-15 Ⓒ
HD Audio Section	
Transistor	
Q4501	E-17 Ⓒ
Q4502	F-16 Ⓒ
Q4507	H-3 Ⓕ
Q4513	F-3 Ⓕ
Q4514	F-2 Ⓕ
Q4515	F-19 Ⓒ
Q4516	F-13 Ⓕ
Q4517	F-3 Ⓕ
Q4518	G-3 Ⓕ
Q4519	H-3 Ⓕ
Q4520	F-3 Ⓕ
Q4521	G-4 Ⓕ
Q4522	G-4 Ⓕ
Transistors & Resistors	
QR4502	E-5 Ⓕ
QR4503	F-5 Ⓕ
QR4505	F-5 Ⓕ
Integrated Circuits	
IC4501	E-19 Ⓒ
IC4503	E-18 Ⓒ
IC4504	F-17 Ⓒ
IC4506	E-17 Ⓒ
IC4507	G-19 Ⓒ
IC4508	G-18 Ⓒ
IC4509	B-4 Ⓕ
Test Points	
TP4501	C-17 Ⓒ
TP4502	C-17 Ⓒ
TP4503	H-19 Ⓒ
TP4504	H-19 Ⓒ
TP4506	G-18 Ⓒ
TP4507	G-18 Ⓒ
TP4508	H-19 Ⓒ
TP4509	G-18 Ⓒ
TP4510	G-18 Ⓒ
TP4511	C-17 Ⓒ
TP G1	F-19 Ⓒ
Adjustments	
VR4501	D-18 Ⓒ
VR4502	H-17 Ⓒ
VR4503	D-17 Ⓒ
VR4504	F-19 Ⓒ
VR4505	H-17 Ⓒ
VR4506	B-17 Ⓒ
VR4507	B-18 Ⓒ
System Control Section	
Transistors	
Q6001	E-20 Ⓒ
Q6002	E-12 Ⓒ
Q6005	G-13 Ⓒ
Q6006	H-8 Ⓕ
Q6007	H-12 Ⓒ
Q6008	H-12 Ⓒ
Q6009	D-20 Ⓒ
Q6010	E-1 Ⓕ
Q6011	G-8 Ⓕ
Q6012	E-20 Ⓒ
Q6013	E-14 Ⓒ
Q6014	E-13 Ⓒ
Q6015	E-13 Ⓒ
Q6016	E-8 Ⓕ
Transistors & Resistors	
QR6001	E-9 Ⓕ
QR6002	G-9 Ⓕ
QR6003	G-9 Ⓕ
QR6004	G-9 Ⓕ
QR6005	E-15 Ⓒ
QR6006	E-9 Ⓕ
QR6007	G-8 Ⓕ
QR6008	F-1 Ⓕ
QR6009	E-1 Ⓕ
QR6010	G-8 Ⓕ
QR6011	D-12 Ⓒ
Integrated Circuits	
IC6001	F-9 Ⓕ
IC6002	G-13 Ⓒ
IC6003	D-14 Ⓒ
IC6005	E-20 Ⓒ
IC6006	B-12 Ⓒ
IC6007	C-9 Ⓕ
Test Points	
TP6001	E-13 Ⓒ
TP6002	D-14 Ⓒ
TP6003	E-13 Ⓒ
TP6004	D-20 Ⓒ
Adjustments	
VR6001	E-14 Ⓒ
VR6002	D-20 Ⓒ
Sub System Control Section	
Transistors	
Q6601	B-3 Ⓕ
Q6602	B-18 Ⓒ
Q6603	B-3 Ⓕ
Transistors & Resistors	
QR6601	C-16 Ⓒ
QR6602	B-17 Ⓒ
QR6603	D-14 Ⓒ
QR6604	C-14 Ⓒ
QR6605	D-8 Ⓕ
QR6606	D-14 Ⓒ
QR6607	A-2 Ⓕ
QR6608	C-1 Ⓕ
QR6609	D-14 Ⓒ
Integrated Circuits	
IC6601	C-17 Ⓒ
IC6602	C-19 Ⓒ
IC6603	D-7 Ⓕ
IC6604	A-1 Ⓕ
IC6605	B-1 Ⓕ
Test Point	
TP6601	A-20 Ⓒ
Adjustment	
R6619	A-20 Ⓒ
Other Section	
Transistors	
Q1501	G-21 Ⓒ
Q1502	G-22 Ⓒ
Q1503	E-10 Ⓒ
Adjustment	
VR66019	A-21 Ⓒ

ADDRESS INFORMATION
Ⓒ ··· COMPONENT SIDE
Ⓕ ··· FOIL SIDE

VIDEO C.B.A. (VEP03385A)

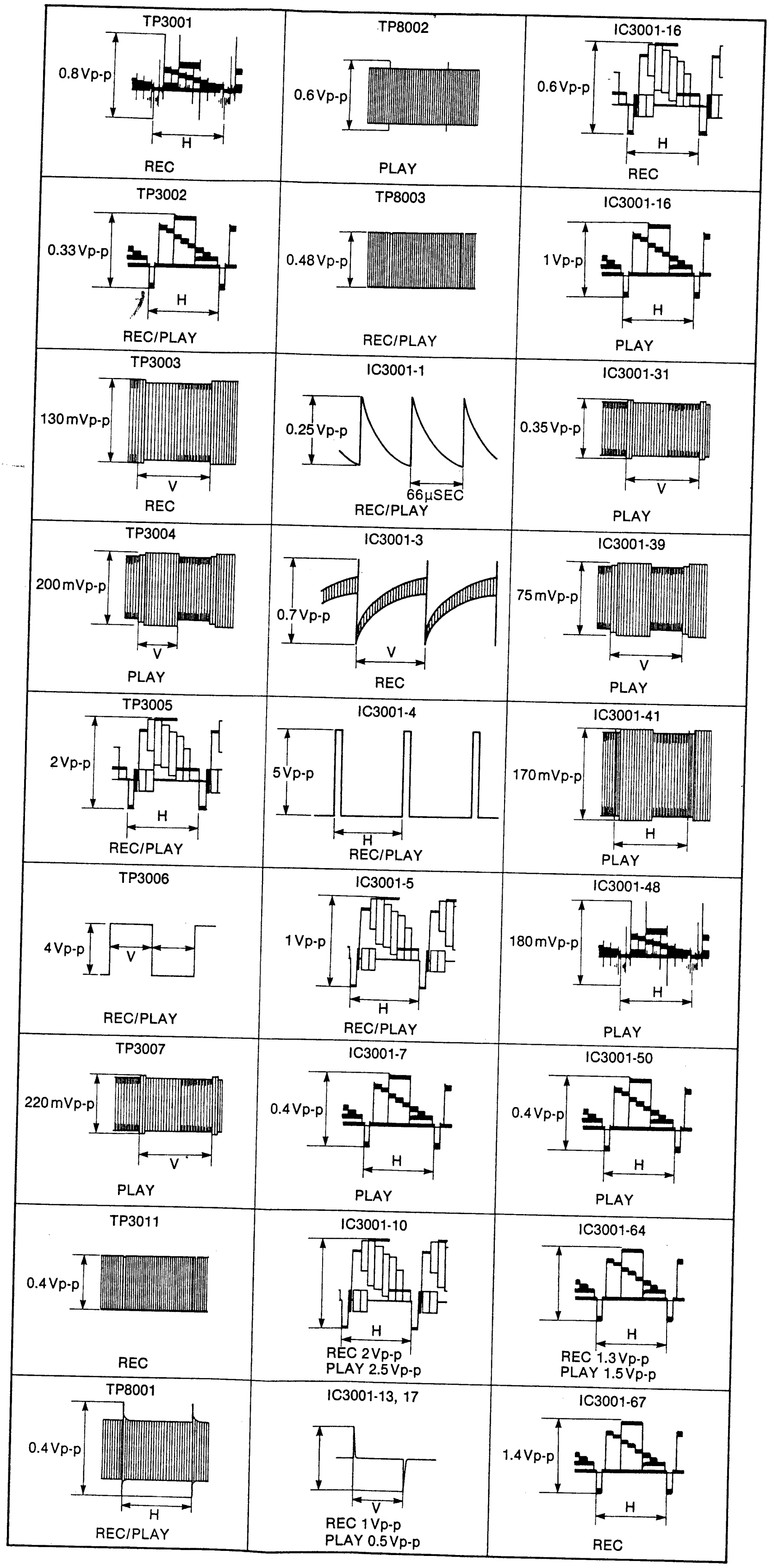

C
B
A
1
2
3
4
5
6
7
(COMPONENT SIDE)
(FOIL
Q VR
VR3008
TP3004
R3062
R3063
C3069
C3070
FL3004
C3068
C3079
R3054
R3053
R3055
R3052
Q3010
C3067
C3065
C3066
C3064
C3063
C3062
IC3001
L3026
C3084
R3042
C3054
R3044
C3056
L3023
C3013
FL3001
C3011
L3002
TP8005
C3090
FL3002
C3006
TP3001
TP3002
DETAIL ENHANCE LEVEL
TP3010
TP3011
C3078
FL3003
FL3005
C3093
C3058
IC3005
L3018
C3053
C3041
L3021
L3003
L3004
DL3001
FL8005
C3012
L3022
C3001
C3002
C3003
Q3001
R3006
R3003
R3009
C3004
R3013
VR3001
EE LEVEL
Q3003
R3011
C3027
L3001
C3026
L3007
C3022
C3007
C3020
VR3002
C3030
C3029
VR3003
Y-REC CURR.
IC3002
IC3003
C3047
C3045
C3042
C3040
C3036
TP3008
C3052
C3055
L3020
C3087
L3006
L3012
C3024
C3019
TP3009 (GND)
C3071
C3072
TP3003
L3016
L3015
C3081
C3032
L3011
L3013
IC3004
FL8002
FL8001
C8016
L8003
D8001
C8017
TP8004
L3008
C3031
C3074
IC3006
C3075
C3073
C3060
P3001
R3038
C3061
DL8001
C8003
IC8001
L3009
C3082
C3076
C8015
C8014
Q8021
R8027
FL8003
C-REC CURR.
VR8001
TP3007
L8006
C8020
L3024
P3003
L8001
C8002
C8009
L8004
X8001
TP8002
TP8003
TP8001
C8007
L8002
R8028
Q8005
D8002
L8007
L3005
TP3012
TO FOIL SIDE P3003-⑯
QR8005
TP3006
L3010
C8008
C8012
C8013
P3002
L8008
L3025
TP3005
TO QR


FL3003
FL3005
C3093
QR8005
TO COMPONENT SIDE
QR8005-B
QR8003
Q3008
R3045
R3013
R3014
QR3001
R3027
Q3006
R3029
R3030
R3057
R3025
R3026
C3021
C3015
C3023
C3024
C3016
C3025
C3018
Q8006
R8029
R8030
C8022
R8021
Q8003
Q8004
R8018
R8017
R8003
R8004
R3076
TH3001
R3012
R3008
Q3005
Q3002
Q8002
C8005
QR8001
C8006
R8035
R8008
QR8002
QR8004
D8003
R8001
C8010
R8033
R8034
R8014
NPO
D3002
Q3009
C8024
L8009
R3058
R3016
C3091
C3094
R3002
R3005
R3001
C3001
C3082
R3004
R3065
C3085
C3086
Q3012
R3066
R3064
Q3011
Q3007
R3040
C3083
R3034
Q8001
R8007
R3070
C3044
R8023
R8024
R8025
Q8004
Q8005
R3022
7
8
9
10
11
12
13
(FOIL SIDE)

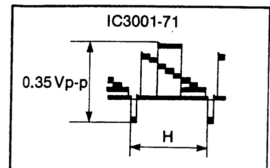

Q3009
Q3012
Q3007
Q3002
Q8002
QR8002
QR8001
QR8004
Q3001
Q3004
Q3003
R3005
R3001
R3002
R3004
R3008
R3065
R3066
R3070
R8023
R8024
R8014
R8001
R8008
R8035
C3094
C3085
C3091
C3092
C3044
C8010
C8006
D3001
D8003
NPO
11
12
13

VIDEO C.B.A.	
Transistors	
Q3001	C-3 Ⓒ
Q3002	B-11 Ⓕ
Q3003	B-4 Ⓒ
Q3004	B-10 Ⓕ
Q3005	B-10 Ⓕ
Q3006	B-8 Ⓕ
Q3007	C-12 Ⓕ
Q3008	C-8 Ⓕ
Q3009	C-10 Ⓕ
Q3010	C-4 Ⓒ
Q3011	C-12 Ⓕ
Q3012	C-12 Ⓕ
Q8001	A-12 Ⓕ
Q8002	B-10 Ⓕ
Q8003	B-9 Ⓕ
Q8004	A-13 Ⓕ
Q8005	A-5 Ⓒ
Q8006	A-9 Ⓕ
Q8007	A-13 Ⓕ
Transistors & Resistors	
QR3001	B-8 Ⓕ
QR3003	C-9 Ⓕ
QR8001	B-11 Ⓕ
QR8002	B-11 Ⓕ
QR8003	A-13 Ⓕ
QR8004	B-11 Ⓕ
QR8005	A-7 Ⓒ
Integrated Circuits	
IC3001	C-5 Ⓒ
IC3002	B-5 Ⓒ
IC3003	B-6 Ⓒ
IC3004	B-1 Ⓒ
IC3005	C-1 Ⓒ
IC3006	B-7 Ⓒ
IC8001	B-2 Ⓒ
Test Points	
TP3001	C-5 Ⓒ
TP3002	C-5 Ⓒ
TP3003	B-1 Ⓒ
TP3004	C-2 Ⓒ
TP3005	A-6 Ⓒ
TP3006	A-1 Ⓒ
TP3007	A-1 Ⓒ
TP3008	B-2 Ⓒ
TP3009	B-7 Ⓒ
TP3010	C-6 Ⓒ
TP3011	C-6 Ⓒ
TP3012	A-6 Ⓒ
TP8001	A-4 Ⓒ
TP8002	A-4 Ⓒ
TP8003	A-4 Ⓒ
TP8004	B-5 Ⓒ
TP8005	C-4 Ⓒ
Adjustments	
VR3001	C-4 Ⓒ
VR3002	C-6 Ⓒ
VR3003	C-6 Ⓒ
VR3008	C-2 Ⓒ
VR8001	A-3 Ⓒ

ADDRESS INFORMATION
Ⓒ ··· COMPONENT SIDE
Ⓕ ··· FOIL SIDE

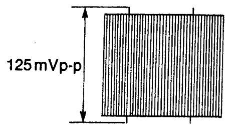


IC3001-71



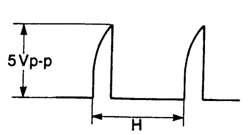
REC

IC8001-20



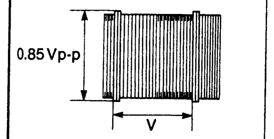
REC

IC8001-54



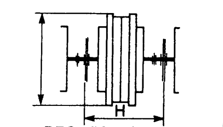
REC

IC3001-78



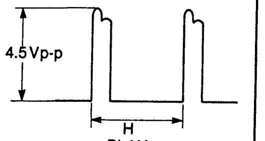
REC

IC8001-23



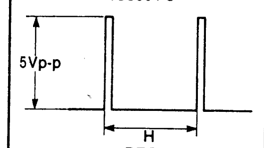
REC 170mVp-p
PLAY 0.5Vp-p

IC8001-54



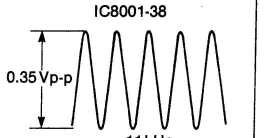
PLAY

IC8001-3



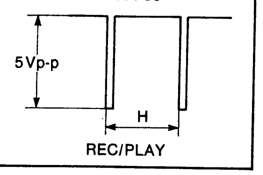
REC

IC8001-38



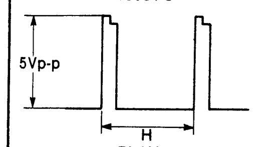
REC/PLAY

IC8001-56



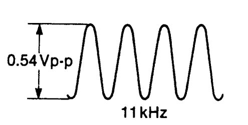
REC/PLAY

IC8001-3



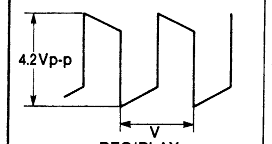
PLAY

IC8001-39



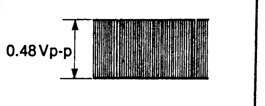
REC/PLAY

IC8001-5



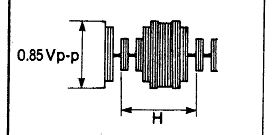
REC/PLAY

TP8003



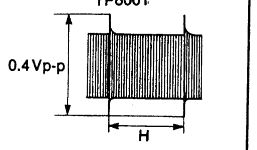
REC/PLAY

IC8001-16



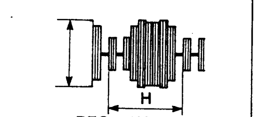
PLAY

TP8001



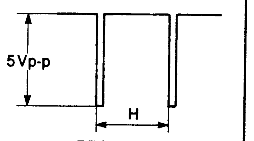
REC/PLAY

IC8001-17



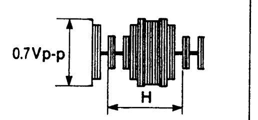
REC 1.1Vp-p
PLAY 1.5Vp-p

IC8001-50



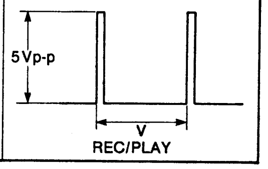
REC/PLAY

IC8001-18



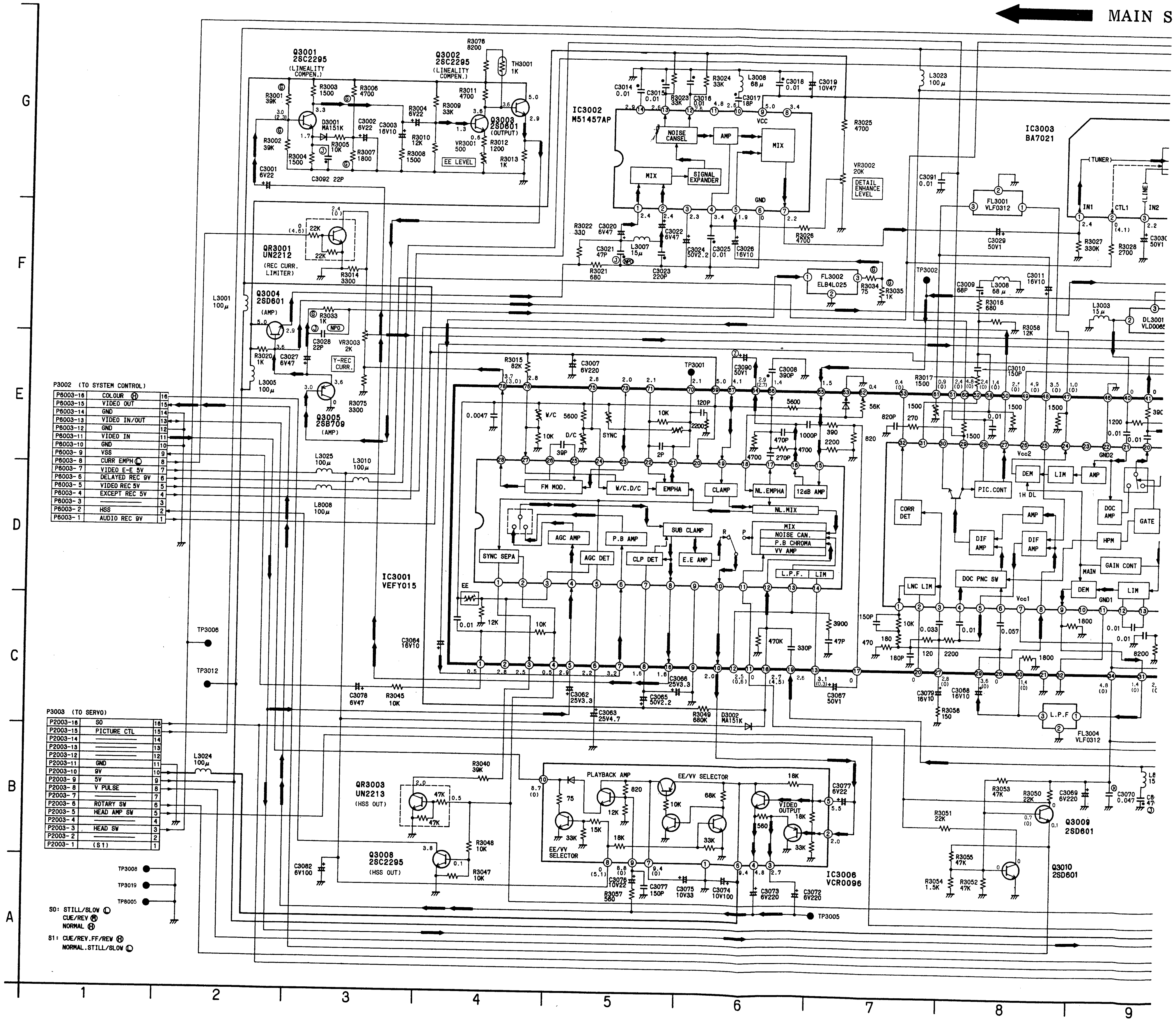
REC

IC8001-53



REC/PLAY

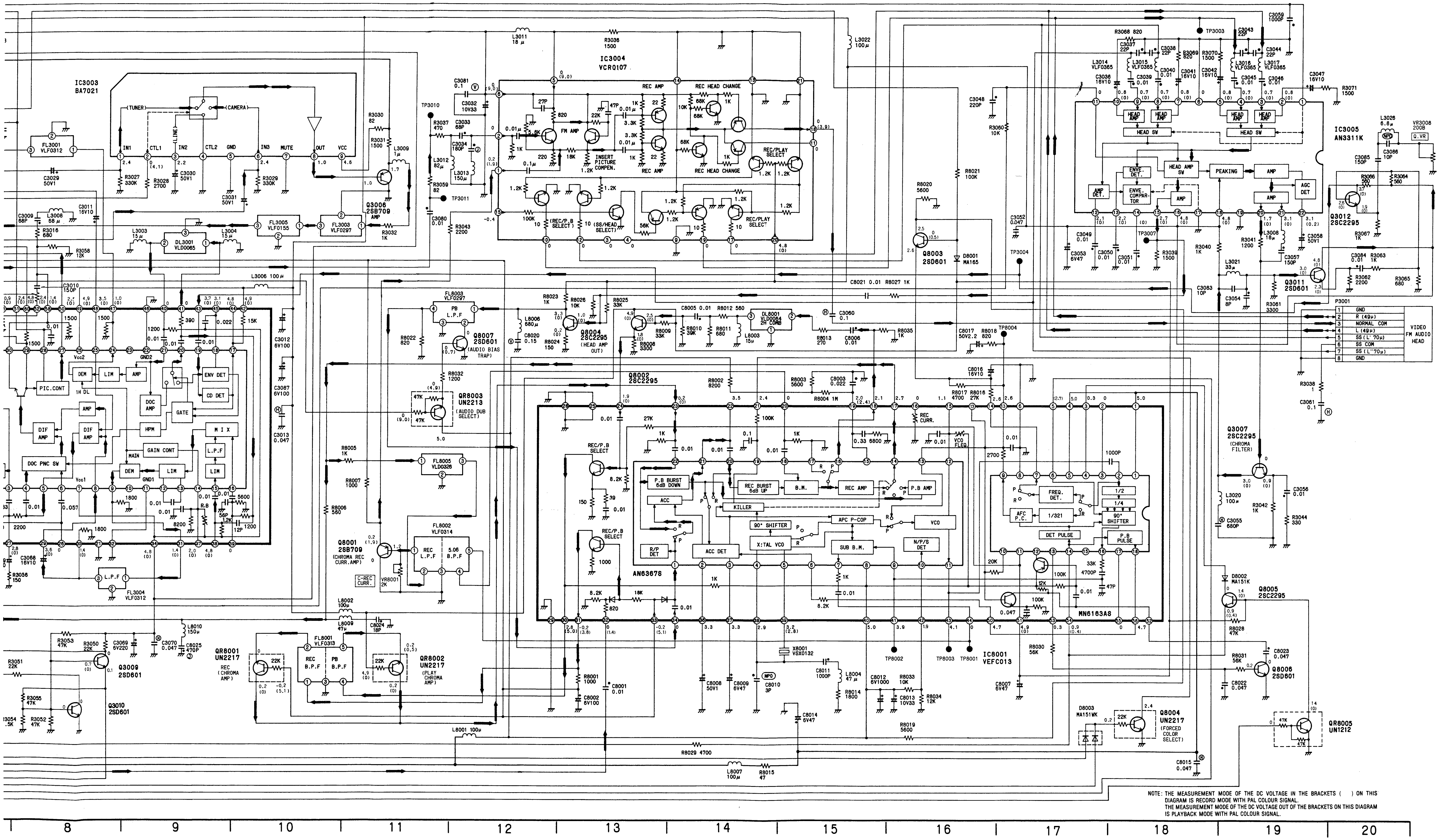
VIDEO SCHEMATIC DIAGRAM


MAIN S
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
Q3001 2SC2295 (LINEALITY COMPEN.)
Q3002 2SC2295 (LINEALITY COMPEN.)
Q3003 2SD601 (OUTPUT)
TH3001 1K
R3076 8200
D3001 MA151K
EE LEVEL
VR3001 500
C3092 22P
IC3002 M51457AP
NOISE CANSEL
AMP
MIX
SIGNAL EXPANDER
VCC
GND
VR3002 20K
DETAIL ENHANCE LEVEL
IC3003 BA7021
TUNER
LINE
IN1
CTL1
IN2
FL3001 VLF0312
FL3002 ELB4L025
QR3001 UN2212 (REC CURR. LIMITER)
Q3004 2SD601 (AMP)
Q3005 2SB709 (AMP)
NPO
Y-REC CURR.
VR3003 2K
TP3001
TP3002
L3001 100μ
L3005 100μ
L3025 100μ
L3010 100μ
L8008 100μ
L3024 100μ
L3003 15μ
DL3001 VLD006
P3002 (TO SYSTEM CONTROL)
P6003-16 COLOUR
P6003-15 VIDEO OUT
P6003-14 GND
P6003-13 VIDEO IN/OUT
P6003-12 GND
P6003-11 VIDEO IN
P6003-10 GND
P6003-9 VSS
P6003-8 CURR EMPH
P6003-7 VIDEO E-E 5V
P6003-6 DELAYED REC 9V
P6003-5 VIDEO REC 5V
P6003-4 EXCEPT REC 5V
P6003-3
P6003-2 HSS
P6003-1 AUDIO REC 9V
IC3001 VEFY015
FM MOD.
W/C.D/C
EMPHA
CLAMP
NL.EMPHA
12dB AMP
NL.MIX
SYNC SEPA
AGC AMP
AGC DET
P.B AMP
CLP DET
SUB CLAMP
E.E AMP
MIX
NOISE CAN.
P.B CHROMA
VV AMP
L.P.F.
LIM
EE
W/C
D/C
SYNC
CORR DET
DEM
LIM
AMP
PIC.CONT
1H DL
DOC AMP
GATE
DIF AMP
HPM
GAIN CONT
MAIN
LNC LIM
DOC PNC SW
GND1
GND2
Vcc1
Vcc2
L.P.F
FL3004 VLF0312
TP3006
TP3012
P3003 (TO SERVO)
P2003-16 SO
P2003-15 PICTURE CTL
P2003-14
P2003-13
P2003-12
P2003-11 GND
P2003-10 9V
P2003-9 5V
P2003-8 V PULSE
P2003-7
P2003-6 ROTARY SW
P2003-5 HEAD AMP SW
P2003-4
P2003-3 HEAD SW
P2003-2
P2003-1 (S1)
TP3008
TP3019
TP8005
S0: STILL/SLOW Ⓛ CUE/REV Ⓡ NORMAL Ⓗ
S1: CUE/REV.FF/REW Ⓗ NORMAL.STILL/SLOW Ⓛ
QR3003 UN2213 (HSS OUT)
Q3008 2SC2295 (HSS OUT)
PLAYBACK AMP
EE/VV SELECTOR
VIDEO OUTPUT
IC3006 VCR0096
TP3005
D3002 MA151K
Q3009 2SD601
Q3010 2SD601

MAIN SIGNAL PATH IN RECORD MODE

MAIN SIGNAL PATH IN PLAYBACK MODE

NOTE: DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST. AND MAY BE SLIGHTLY DIFFERENT OR AMENDED SINCE THIS DRAWING WAS PREPARED.


IC3003
BA7021
(TUNER)
(CAMERA)
(LINE)
IN1
CTL1
IN2
CTL2
GND
IN3
MUTE
OUT
VCC
FL3001 VLF0312
FL3005 VLF0155
FL3003 VLF0297
DL3001 VLD0065
Q3006 2SB709 AMP
IC3004
VCR0107
REC AMP
REC HEAD CHANGE
FM AMP
INSERT PICTURE COMPEN.
REC/PLAY SELECT
(REC/P.B SELECT)
(SS/HEAD SELECT)
TP3010
TP3011
TP3003
TP3004
TP3007
IC3005
AN3311K
HEAD AMP
HEAD SW
ENVE. DET.
ENVE. COMPARATOR
AMP DET.
HEAD AMP SW
PEAKING
AMP
AGC DET
Q3012 2SC2295
Q3011 2SD601
Q3007 2SC2295 (CHROMA FILTER)
P3001
1 GND
2 R (49μ)
3 NORMAL COM
4 L (49μ)
5 SS('L' 70μ)
6 SS COM
7 SS('L''70μ)
8 GND
VIDEO FM AUDIO HEAD
PIC.CONT
DEM
LIM
AMP
ENV DET
CD DET
DOC AMP
GATE
HPM
DIF AMP
MIX
GAIN CONT
L.P.F
DOC PNC SW
FL3004 VLF0312
FL8003 VLF0297 PB L.P.F
Q8007 2SD601 (AUDIO BIAS TRAP)
QR8003 UN2213 (AUDIO DUB SELECT)
Q8004 2SC2295 (HEAD AMP OUT)
DL8001 VLD0084 2H COMB
Q8002 2SC2295
Q8003 2SD601
D8001 MA165
FL8005 VLD0326
FL8002 VLF0314 REC L.P.F 5.06 B.P.F
Q8001 2SB709 (CHROMA REC CURR.AMP)
C-REC CURR.
VR8001 2K
FL8001 VLF0313 REC B.P.F PB B.P.F
QR8001 UN2217 REC (CHROMA AMP)
QR8002 UN2217 (PLAY CHROMA AMP)
Q3009 2SD601
Q3010 2SD601
AN6367S
P.B BURST 6dB DOWN
ACC
REC BURST 6dB UP
B.M.
REC AMP
P.B AMP
KILLER
90° SHIFTER
APC P-COP
VCO
X'TAL VCO
SUB B.M.
N/P/S DET
ACC DET
R/P DET
REC/P.B SELECT
REC CURR.
VCO FLEQ
MN6163AS
FREQ. DET.
1/2
1/4
90° SHIFTER
AFC P.C.
1/321
DET PULSE
P.B PULSE
X8001 VSX0132
IC8001 VEFC013
TP8002
TP8003
TP8001
D8002 MA151K
Q8005 2SC2295
Q8006 2SD601
D8003 MA151WK
Q8004 UN2217 (FORCED COLOR SELECT)
QR8005 UN1212
VR3008 200B
8
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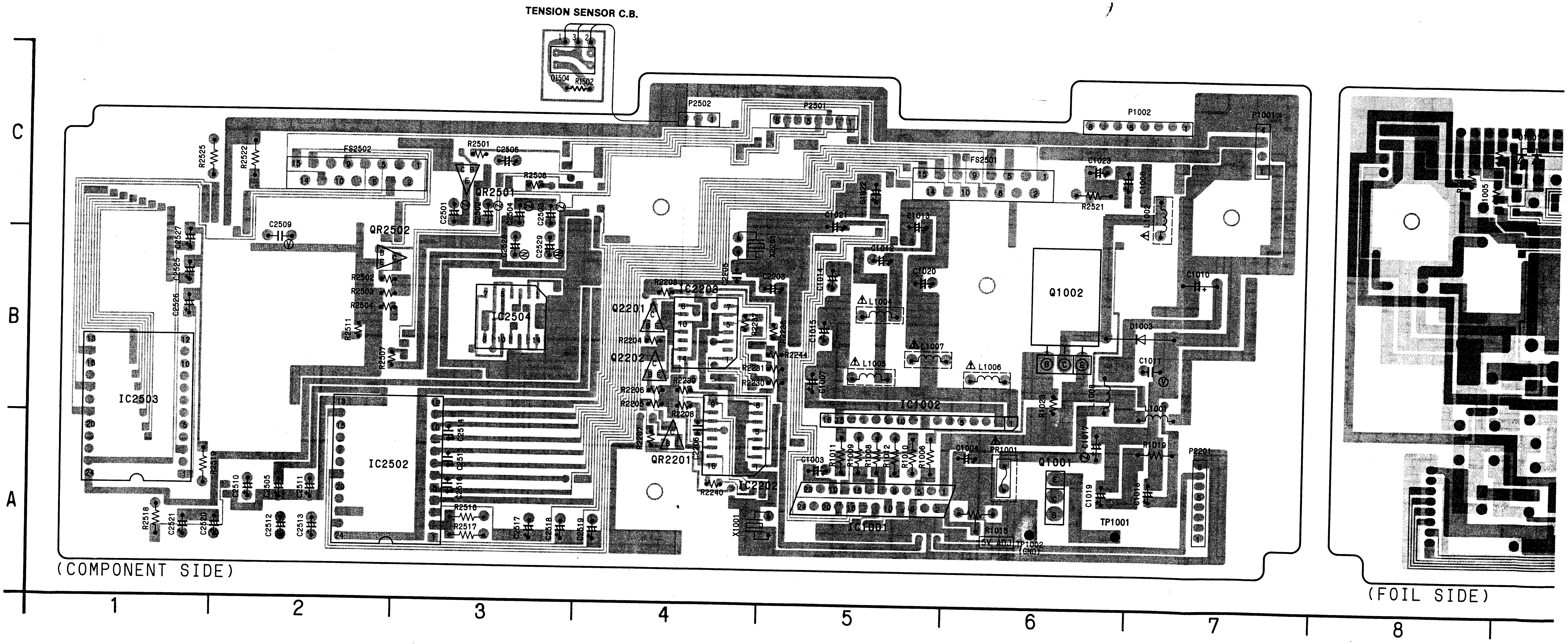
NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS ( ) ON THIS DIAGRAM IS RECORD MODE WITH PAL COLOUR SIGNAL.
THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH PAL COLOUR SIGNAL.

A.V.R. & REEL SERVO C.B.A. (VEP01216B)


TENSION SENSOR C.B.
Q1504
R1502
P2502
P2501
P1002
P1001
FS2502
FS2501
R2525
R2522
R2501
C2506
R2506
QR2501
QR2502
C2509
C2501
C2502
C2504
C2503
C2528
C2529
C2527
C2525
C2526
R2502
R2503
R2504
R2511
R2507
IC2504
IC2503
IC2502
R2519
C2510
C2505
C2511
R2518
C2521
C2520
C2512
C2513
R2516
R2517
C2517
C2518
C2519
C2514
C2515
C2516
Q2201
Q2202
QR2201
IC2203
IC2202
R2203
R2204
R2206
R2205
R2207
R2208
R2239
R2240
R2244
R2231
R2230
X2201
C2203
C2205
C1021
C1022
C1013
C1012
C1020
C1014
C1015
C1007
L1004
L1005
L1007
L1006
Q1002
D1003
C1010
C1011
L1002
C1023
C1009
R2521
IC1002
R1023
L1008
L1001
C1017
R1019
C1003
R1011
R1009
R1008
R1012
R1010
R1006
C1004
PR1001
Q1001
C1019
C1018
P2201
X1001
IC1001
R1015
5V ADJ
TP1002 (GND)
TP1001
R1005
(COMPONENT SIDE)
(FOIL SIDE)
C
B
A
1
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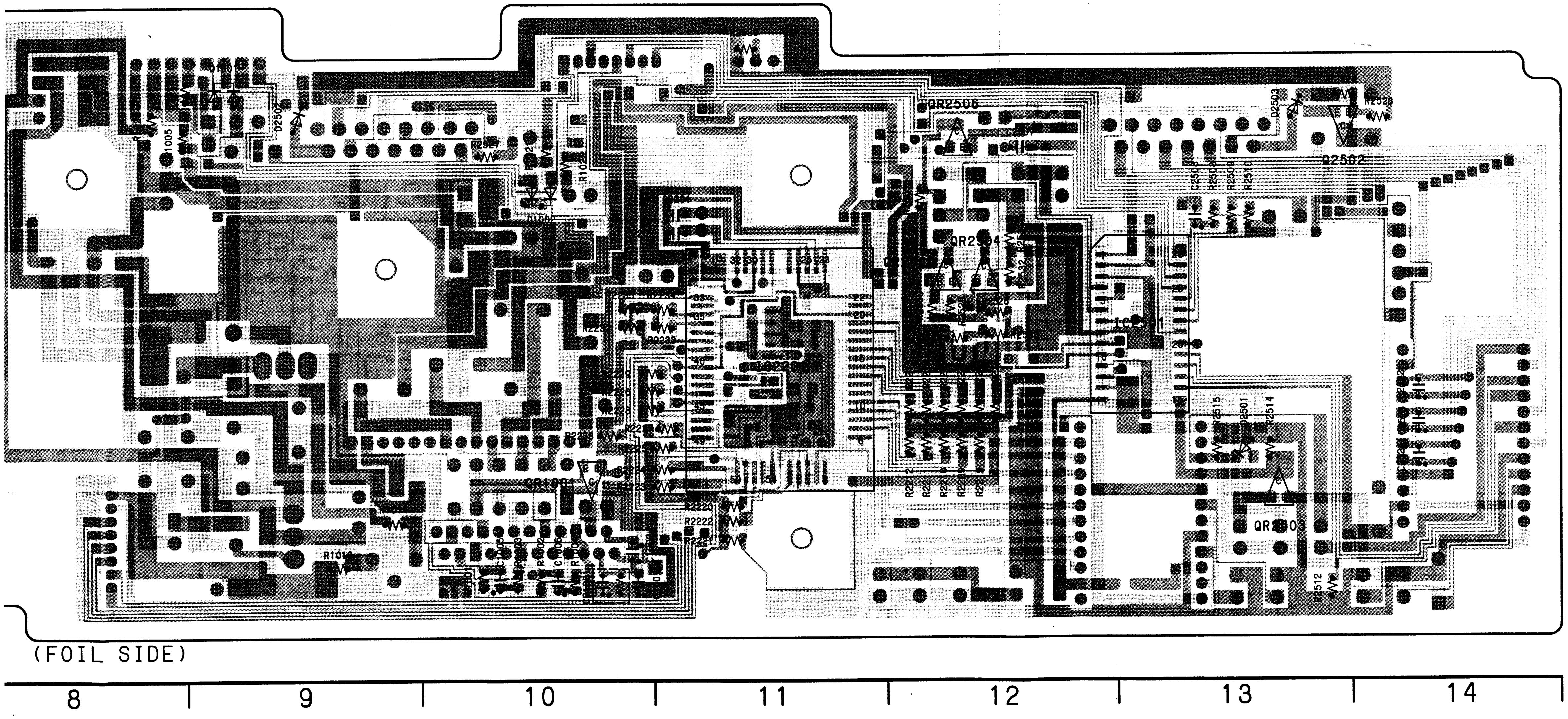
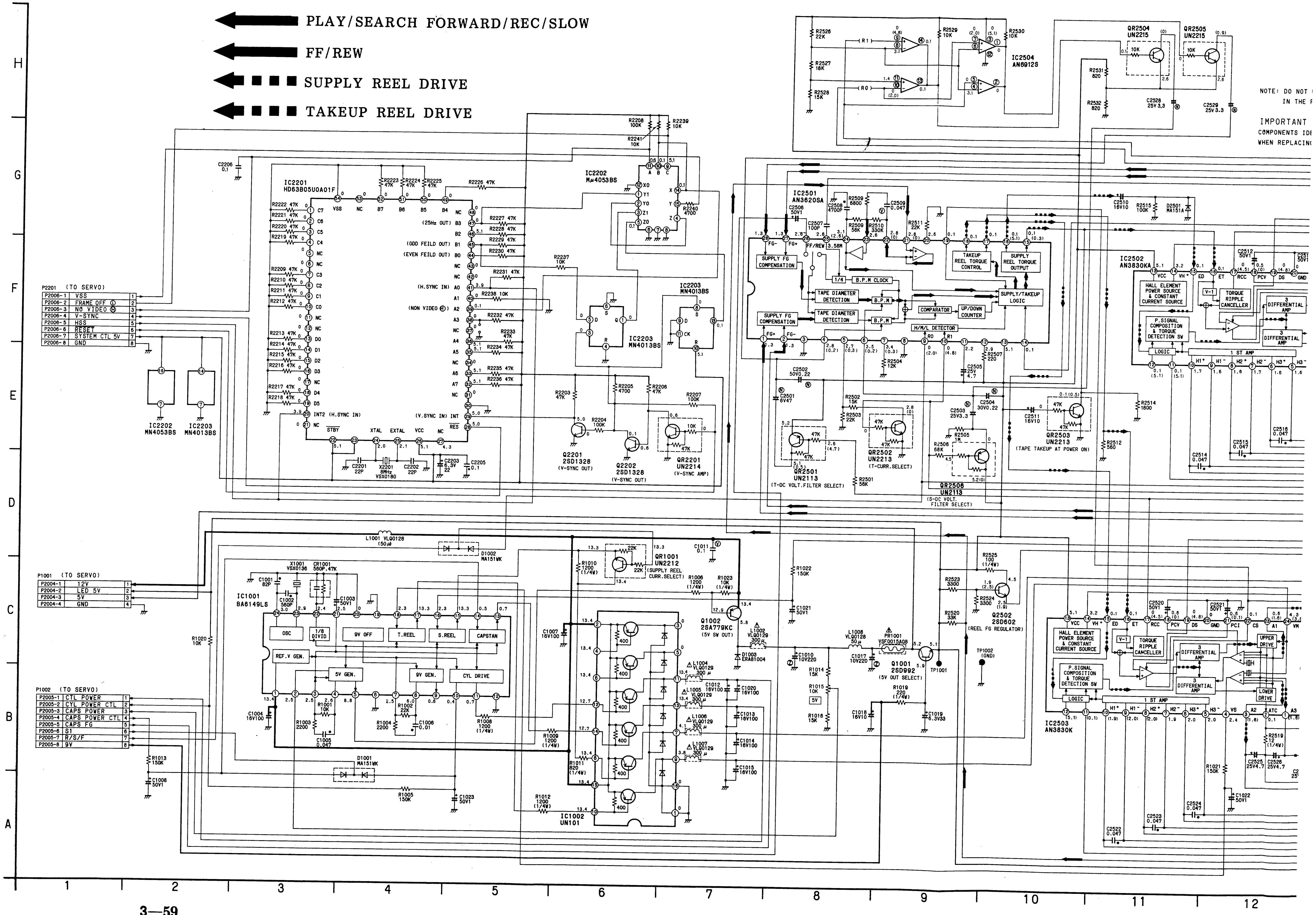
8


(FOIL SIDE)
8
9
10
11
12
13
14
D1001
D1002
D2502
D2503
D2501
R1005
R1022
R1012
R1010
R2527
R2523
R2508
R2509
R2510
R2515
R2514
R2512
R2532
R2220
R2222
R2221
R2233
R2223
R2224
QR1001
QR2504
QR2506
QR2503
Q2502
IC2501
IC2201
E
B
C

A.V.R. & REEL SERVO C.B.A.	
Transistors	
Q1001	A-6 Ⓒ
Q1002	B-6 Ⓒ
Q1504	C-3 Ⓕ
Q2201	B-4 Ⓒ
Q2202	B-4 Ⓒ
Q2502	C-13 Ⓕ
Transistors & Resistors	
QR1001	A-10 Ⓕ
QR2201	A-4 Ⓒ
QR2501	C-3 Ⓒ
QR2502	B-2 Ⓒ
QR2503	A-13 Ⓕ
QR2504	B-12 Ⓕ
QR2505	B-12 Ⓕ
QR2506	C-12 Ⓕ
Integrated Circuits	
IC1001	A-5 Ⓒ
IC1002	B-5 Ⓒ
IC2201	B-11 Ⓕ
IC2202	A-4 Ⓒ
IC2203	B-4 Ⓒ
IC2501	B-13 Ⓕ
IC2502	A-2 Ⓒ
IC2503	B-1 Ⓒ
IC2504	B-3 Ⓒ
Test Points	
TP1001	A-6 Ⓒ
TP1002	A-6 Ⓒ
Adjustments	
R1015	A-6 Ⓒ

ADDRESS INFORMATION
Ⓒ ··· COMPONENT SIDE
Ⓕ ··· FOIL SIDE

A.V.R. & REEL SERVO SCHEMATIC DIAGRAM


PLAY/SEARCH FORWARD/REC/SLOW
FF/REW
SUPPLY REEL DRIVE
TAKEUP REEL DRIVE
IC2201 HD63B05U0A01F
IC2202 MN4053BS
IC2203 MN4013BS
IC2202 MN4053BS
IC2203 MN4013BS
Q2201 2SD1328 (V-SYNC OUT)
Q2202 2SD1328 (V-SYNC OUT)
QR2201 UN2214 (V-SYNC AMP)
X2201 8MHz VSX0180
P2201 (TO SERVO)
P2006-1 VSS
P2006-2 FRAME OFF
P2006-3 NO VIDEO
P2006-4 V-SYNC
P2006-5 HSS
P2006-6 RESET
P2006-7 SYSTEM CTL 5V
P2006-8 GND
P1001 (TO SERVO)
P2004-1 12V
P2004-2 LED 5V
P2004-3 5V
P2004-4 GND
P1002 (TO SERVO)
P2005-1 CTL POWER
P2005-2 CTL POWER CTL
P2005-3 CAPS POWER
P2005-4 CAPS POWER CTL
P2005-5 CAPS FG
P2005-6 S1
P2005-7 R/S/F
P2005-8 9V
IC1001 BA6149LS
OSC
1/8 DIVID
9V OFF
T.REEL
S.REEL
CAPSTAN
REF.V GEN.
5V GEN.
9V GEN.
CYL DRIVE
X1001 VSX0136
CR1001 560P.47K
L1001 VLQ0128 (50μ)
D1002 MA151WK
D1001 MA151WK
IC1002 UN101
QR1001 UN2212 (SUPPLY REEL CURR.SELECT)
Q1002 2SA779KC (5V SW OUT)
D1003 ERA81004
Q1001 2SD992 (5V OUT SELECT)
PR1001 VSF0015A08
L1008 VLQ0128 50μ
TP1001
TP1002 (GND)
Q2502 2SD602 (REEL FG REGULATOR)
IC2501 AN3820SA
SUPPLY FG COMPENSATION
TAPE DIAMETER DETECTION
B.P.M CLOCK
B.P.M
COMPARATOR
UP/DOWN COUNTER
H/M/L DETECTOR
TAKEUP REEL TORQUE CONTROL
SUPPLY REEL TORQUE OUTPUT
SUPPLY/TAKEUP LOGIC
QR2501 UN2113 (T-DC VOLT.FILTER SELECT)
QR2502 UN2213 (T-CURR.SELECT)
QR2503 UN2213 (TAPE TAKEUP AT POWER ON)
QR2506 UN2113 (S-DC VOLT. FILTER SELECT)
IC2504 AN6912S
QR2504 UN2215
QR2505 UN2215
IC2502 AN3830KA
HALL ELEMENT POWER SOURCE & CONSTANT CURRENT SOURCE
P.SIGNAL COMPOSITION & TORQUE DETECTION SW
TORQUE RIPPLE CANCELLER
DIFFERENTIAL AMP
LOGIC
1 ST AMP
IC2503 AN3830K
UPPER DRIVE
LOWER DRIVE
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12

NOTE: DO NOT
IN THE F

IMPORTANT
COMPONENTS IDE
WHEN REPLACIN

GRAM

FORWARD/REC/SLOW

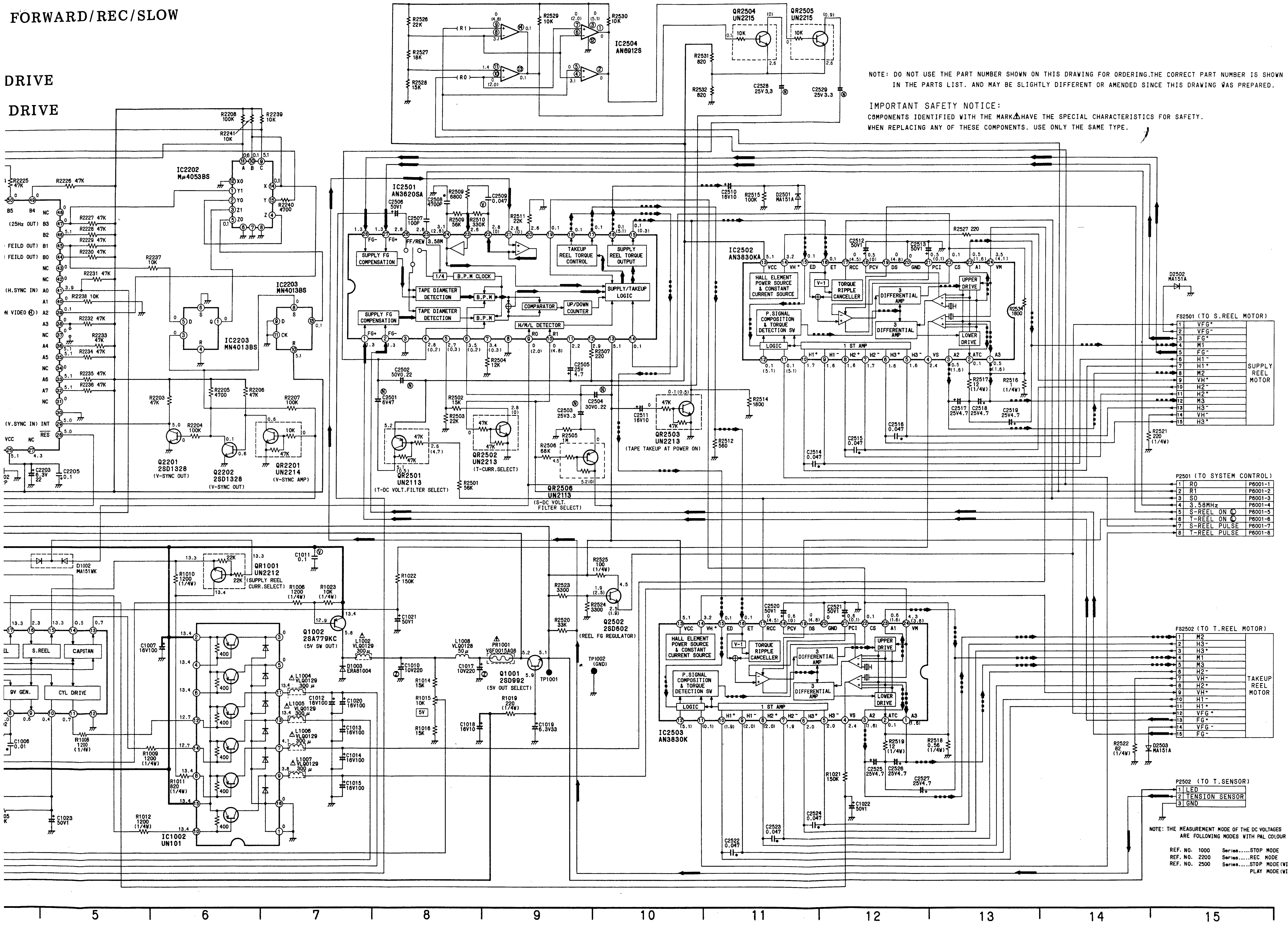
DRIVE

DRIVE

NOTE: DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST. AND MAY BE SLIGHTLY DIFFERENT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

IMPORTANT SAFETY NOTICE:

COMPONENTS IDENTIFIED WITH THE MARK⚠HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS. USE ONLY THE SAME TYPE.

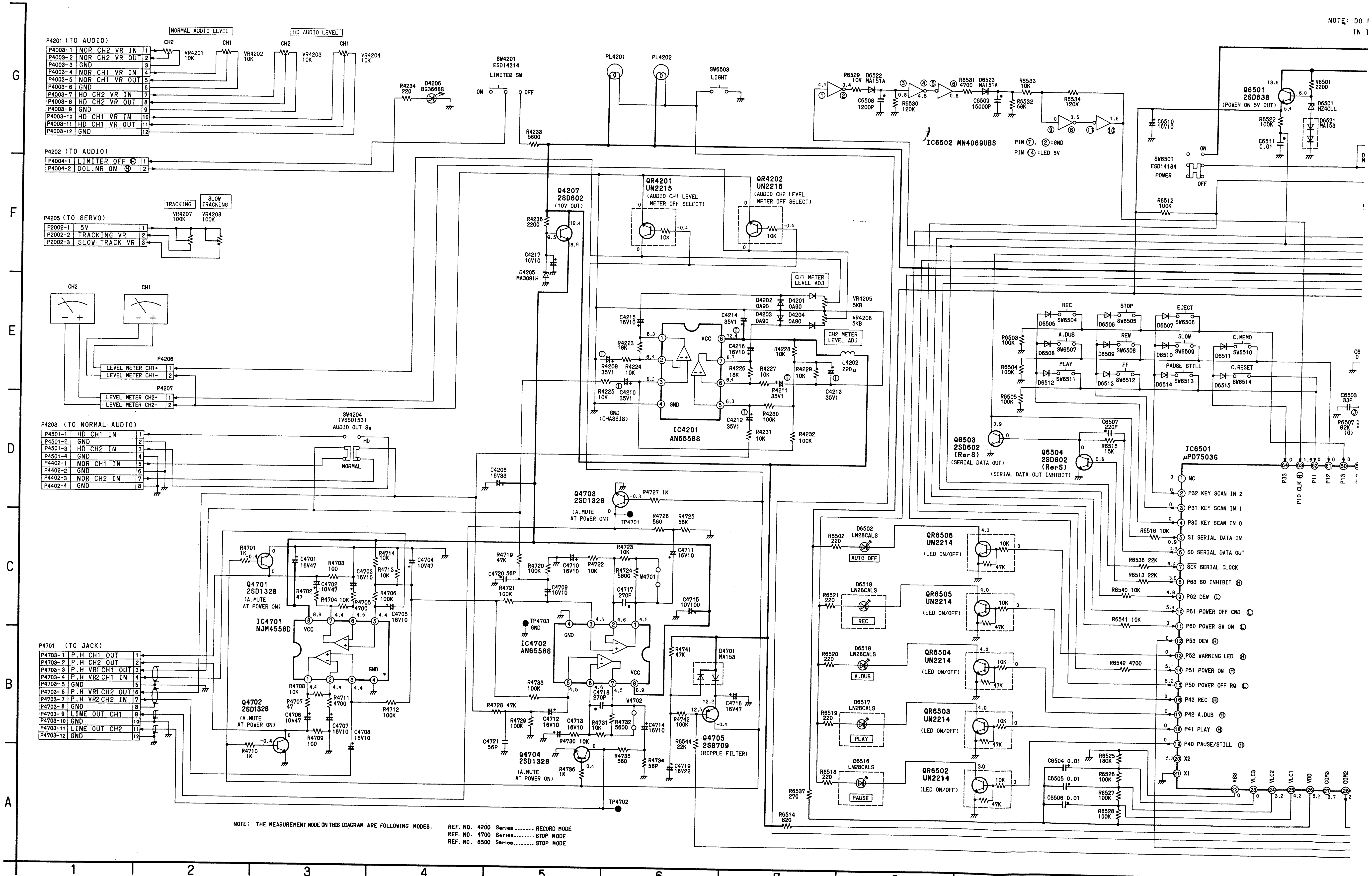


IC2504 AN6912S
QR2504 UN2215
QR2505 UN2215
IC2202 Mμ4053BS
IC2203 MN4013BS
IC2501 AN3620SA
SUPPLY FG COMPENSATION
TAPE DIAMETER DETECTION
B.P.M CLOCK
COMPARATOR
UP/DOWN COUNTER
H/M/L DETECTOR
TAKEUP REEL TORQUE CONTROL
SUPPLY REEL TORQUE OUTPUT
SUPPLY/TAKEUP LOGIC
IC2502 AN3830KA
HALL ELEMENT POWER SOURCE & CONSTANT CURRENT SOURCE
TORQUE RIPPLE CANCELLER
3 DIFFERENTIAL AMP
P.SIGNAL COMPOSITION & TORQUE DETECTION SW
UPPER DRIVE
LOWER DRIVE
LOGIC
1 ST AMP
Q2201 2SD1328 (V-SYNC OUT)
Q2202 2SD1328 (V-SYNC OUT)
QR2201 UN2214 (V-SYNC AMP)
QR2501 UN2113 (T-DC VOLT.FILTER SELECT)
QR2502 UN2213 (T-CURR.SELECT)
QR2506 UN2113 (S-DC VOLT. FILTER SELECT)
QR2503 UN2213 (TAPE TAKEUP AT POWER ON)
QR1001 UN2212 (SUPPLY REEL CURR.SELECT)
Q1002 2SA779KC (5V SW OUT)
Q1001 2SD992 (5V OUT SELECT)
Q2502 2SD602 (REEL FG REGULATOR)
PR1001 VSF0015A08
TP1001
TP1002 (GND)
IC1002 UN101
S.REEL
CAPSTAN
9V GEN.
CYL DRIVE
IC2503 AN3830K
FS2501 (TO S.REEL MOTOR)
1 VFG+
2 VFG-
3 FG+
4 M1
5 FG-
6 H1-
7 H1+
8 M2
9 VH+
10 H2-
11 H2+
12 M3
13 H3-
14 VH-
15 H3+
SUPPLY REEL MOTOR
P2501 (TO SYSTEM CONTROL)
1 R0 P6001-1
2 R1 P6001-2
3 S0 P6001-3
4 3.58MHz P6001-4
5 S-REEL ON P6001-5
6 T-REEL ON P6001-6
7 S-REEL PULSE P6001-7
8 T-REEL PULSE P6001-8
FS2502 (TO T.REEL MOTOR)
1 M2
2 H3-
3 H3+
4 M1
5 M3
6 H2-
7 VH-
8 H2+
9 VH+
10 H1-
11 H1+
12 VFG+
13 FG+
14 VFG-
15 FG-
TAKEUP REEL MOTOR
P2502 (TO T.SENSOR)
1 LED
2 TENSION SENSOR
3 GND
5
6
7
8
9
10
11
12
13
14
15

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGES ARE FOLLOWING MODES WITH PAL COLOUR SIGNAL.

REF. NO. 1000 Series.....STOP MODE
REF. NO. 2200 Series.....REC MODE
REF. NO. 2500 Series.....STOP MODE (WITHIN BRACKETS)
PLAY MODE (WITHOUT BRACKETS)

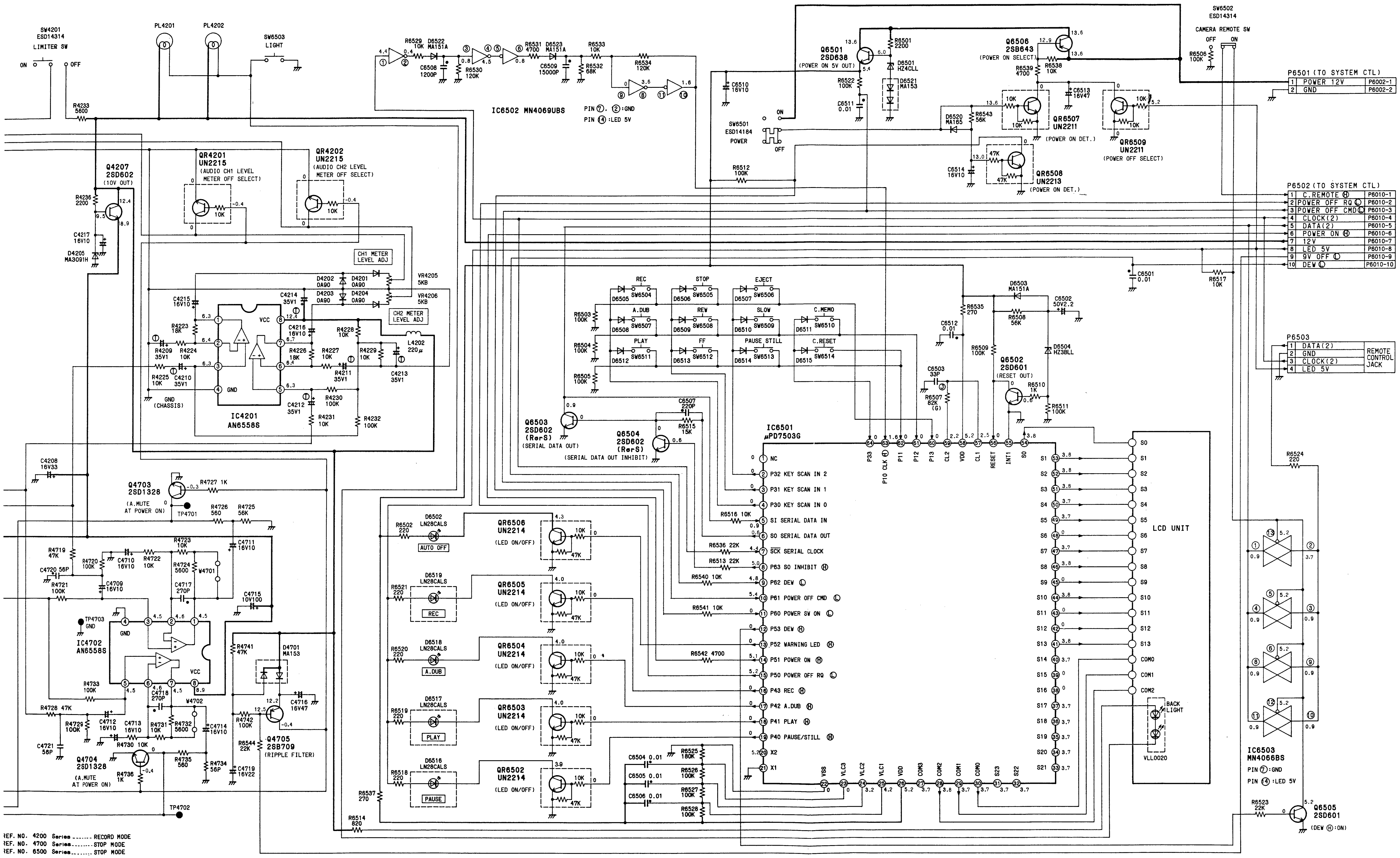
FRONT SCHEMATIC DIAGRAM


G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
NORMAL AUDIO LEVEL
HD AUDIO LEVEL
P4201 (TO AUDIO)
P4003-1 NOR CH2 VR IN
P4003-2 NOR CH2 VR OUT
P4003-3 GND
P4003-4 NOR CH1 VR IN
P4003-5 NOR CH1 VR OUT
P4003-6 GND
P4003-7 HD CH2 VR IN
P4003-8 HD CH2 VR OUT
P4003-9 GND
P4003-10 HD CH1 VR IN
P4003-11 HD CH1 VR OUT
P4003-12 GND
VR4201 10K
VR4202 10K
VR4203 10K
VR4204 10K
P4202 (TO AUDIO)
P4004-1 LIMITER OFF
P4004-2 DOL.NR ON
P4205 (TO SERVO)
P2002-1 5V
P2002-2 TRACKING VR
P2002-3 SLOW TRACK VR
TRACKING
SLOW TRACKING
VR4207 100K
VR4208 100K
P4206
LEVEL METER CH1+
LEVEL METER CH1-
P4207
LEVEL METER CH2+
LEVEL METER CH2-
P4203 (TO NORMAL AUDIO)
P4501-1 HD CH1 IN
P4501-2 GND
P4501-3 HD CH2 IN
P4501-4 GND
P4402-1 NOR CH1 IN
P4402-2 GND
P4402-3 NOR CH2 IN
P4402-4 GND
SW4204 (VSS0153) AUDIO OUT SW
HD
NORMAL
P4701 (TO JACK)
P4703-1 P.H CH1 OUT
P4703-2 P.H CH2 OUT
P4703-3 P.H VR1 CH1 OUT
P4703-4 P.H VR2 CH1 IN
P4703-5 GND
P4703-6 P.H VR1 CH2 OUT
P4703-7 P.H VR2 CH2 IN
P4703-8 GND
P4703-9 LINE OUT CH1
P4703-10 GND
P4703-11 LINE OUT CH2
P4703-12 GND
SW4201 ESD14314 LIMITER SW
ON
OFF
D4206 BG3668S
PL4201
PL4202
SW6503 LIGHT
Q4207 2SD602 (10V OUT)
D4205 MA3091H
QR4201 UN2215 (AUDIO CH1 LEVEL METER OFF SELECT)
QR4202 UN2215 (AUDIO CH2 LEVEL METER OFF SELECT)
CH1 METER LEVEL ADJ
CH2 METER LEVEL ADJ
VR4205 5KB
VR4206 5KB
IC4201 AN6558S
GND (CHASSIS)
Q4703 2SD1328 (A.MUTE AT POWER ON)
TP4701
Q4701 2SD1328 (A.MUTE AT POWER ON)
IC4701 NJM4556D
Q4702 2SD1328 (A.MUTE AT POWER ON)
IC4702 AN6558S
TP4703 GND
Q4704 2SD1328 (A.MUTE AT POWER ON)
Q4705 2SB709 (RIPPLE FILTER)
D4701 MA153
TP4702
IC6502 MN4069UBS
PIN ⑦, ②:GND
PIN ⑭:LED 5V
Q6501 2SD638 (POWER ON 5V OUT)
D6501 HZ6CLL
D6521 MA153
SW6501 ESD14184 POWER
ON
OFF
REC
STOP
EJECT
A.DUB
REW
SLOW
C.MEMO
PLAY
FF
PAUSE STILL
C.RESET
Q6503 2SD602 (RorS) (SERIAL DATA OUT)
Q6504 2SD602 (RorS) (SERIAL DATA OUT INHIBIT)
IC6501 µPD7503G
QR6506 UN2214 (LED ON/OFF)
QR6505 UN2214 (LED ON/OFF)
QR6504 UN2214 (LED ON/OFF)
QR6503 UN2214 (LED ON/OFF)
QR6502 UN2214 (LED ON/OFF)
D6502 LN28CALS AUTO OFF
D6519 LN28CALS REC
D6518 LN28CALS A.DUB
D6517 LN28CALS PLAY
D6516 LN28CALS PAUSE
NC
P32 KEY SCAN IN 2
P31 KEY SCAN IN 1
P30 KEY SCAN IN 0
SI SERIAL DATA IN
SO SERIAL DATA OUT
SCK SERIAL CLOCK
P63 SO INHIBIT
P62 DEW
P61 POWER OFF CMD
P60 POWER SW ON
P53 DEW
P52 WARNING LED
P51 POWER ON
P50 POWER OFF RQ
P43 REC
P42 A.DUB
P41 PLAY
P40 PAUSE/STILL
X2
X1
VSS
VLC3
VLC2
VLC1
VDD
COM3
COM2
P33
P10 CLK
P11
P12
NOTE: DO
IN

NOTE: THE MEASUREMENT MODE ON THIS DIAGRAM ARE FOLLOWING MODES.

REF. NO. 4200 Series .... RECORD MODE
REF. NO. 4700 Series .... STOP MODE
REF. NO. 6500 Series .... STOP MODE

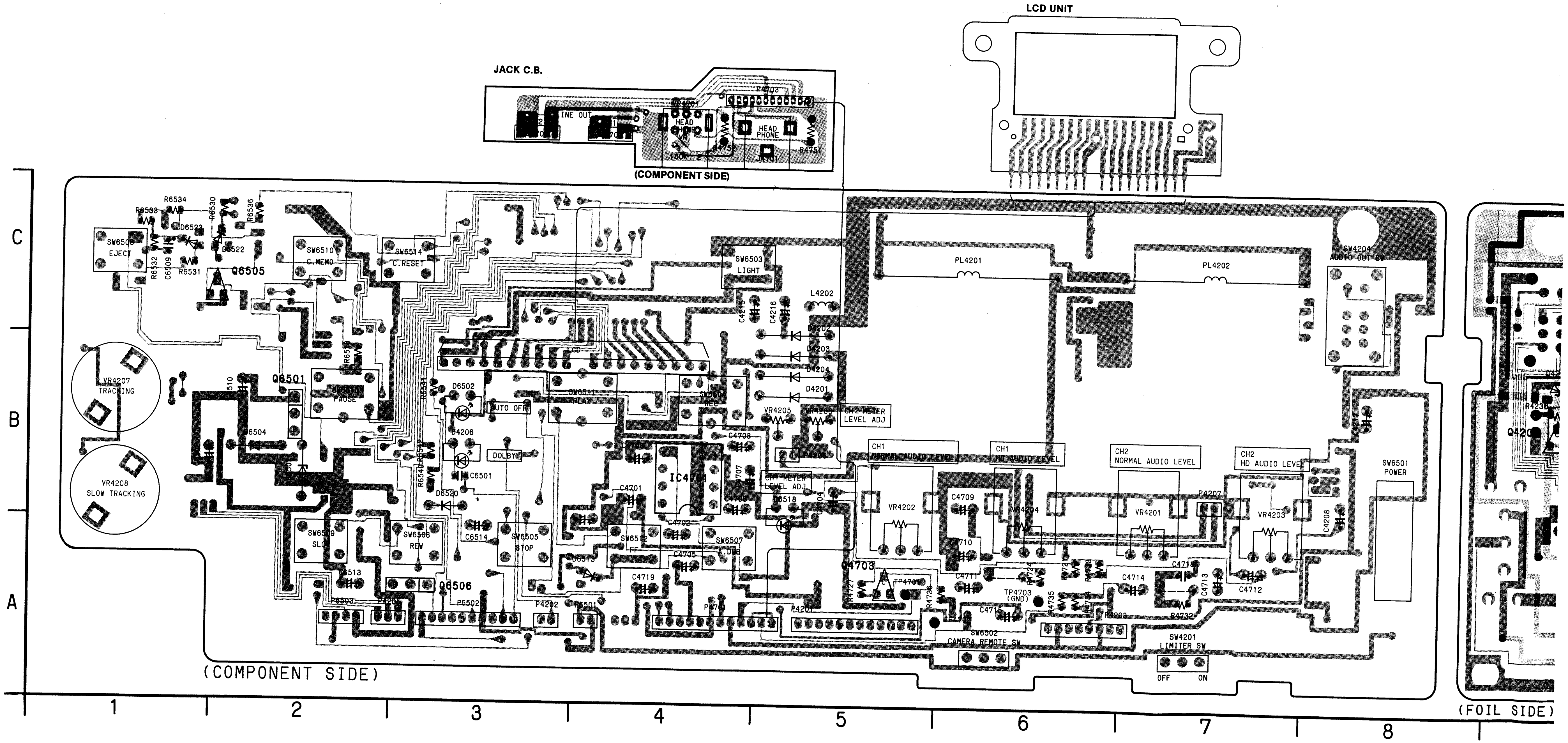
NOTE: DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST. AND MAY BE SLIGHTLY DIFFERENT OR AMENDED SINCE THIS DRAWING WAS PREPARED.


SW4201 ESD14314 LIMITER SW
ON OFF
PL4201
PL4202
SW6503 LIGHT
R4233 5600
Q4207 2SD602 (10V OUT)
R4236 2200
C4217 16V10
D4205 MA3091H
QR4201 UN2215 (AUDIO CH1 LEVEL METER OFF SELECT)
QR4202 UN2215 (AUDIO CH2 LEVEL METER OFF SELECT)
CH1 METER LEVEL ADJ
CH2 METER LEVEL ADJ
VR4205 5KB
VR4206 5KB
D4202 OA90
D4201 OA90
D4203 OA90
D4204 OA90
C4215 16V10
C4214 35V1
C4216 16V10
R4228 10K
L4202 220µ
R4223 18K
R4209 35V1
R4224 10K
R4225 10K
C4210 35V1
R4226 18K
R4227 10K
R4229 10K
R4211 35V1
C4213 35V1
GND (CHASSIS)
IC4201 AN6558S
C4212 35V1
R4230 100K
R4231 10K
R4232 100K
C4208 16V33
Q4703 2SD1328 (A.MUTE AT POWER ON)
R4727 1K
TP4701
R4726 560
R4725 56K
R4719 47K
R4720 100K
C4720 56P
R4721 100K
C4710 16V10
R4722 10K
R4723 10K
R4724 5600
W4701
C4711 16V10
C4709 16V10
C4717 270P
C4715 10V100
TP4703 GND
IC4702 AN6558S
R4733 100K
R4728 47K
R4729 100K
C4712 16V10
C4713 16V10
C4718 270P
R4731 10K
R4732 5600
W4702
C4714 16V10
R4741 47K
D4701 MA153
C4716 16V47
R4742 100K
Q4705 2SB709 (RIPPLE FILTER)
R6544 22K
C4721 56P
R4730 10K
Q4704 2SD1328 (A.MUTE AT POWER ON)
R4736 1K
R4735 560
R4734 56P
C4719 16V22
TP4702
R6529 10K
D6522 MA151A
C6508 1200P
R6530 120K
R6531 4700
D6523 MA151A
C6509 15000P
R6533 10K
R6532 68K
R6534 120K
IC6502 MN4069UBS
PIN ⑦, ②:GND
PIN ⑭:LED 5V
C6510 16V10
SW6501 ESD14184 POWER
ON OFF
R6512 100K
Q6501 2SD638 (POWER ON 5V OUT)
R6501 2200
D6501 HZ4CLL
D6521 MA153
R6522 100K
C6511 0.01
Q6506 2SB643 (POWER ON SELECT)
R6539 4700
R6538 10K
C6513 16V47
D6520 MA165
R6543 56K
QR6507 UN2211 (POWER ON DET.)
QR6509 UN2211 (POWER OFF SELECT)
C6514 16V10
QR6508 UN2213 (POWER ON DET.)
SW6502 ESD14314 CAMERA REMOTE SW
OFF ON
R6506 100K
P6501 (TO SYSTEM CTL)
1 POWER 12V P6002-1
2 GND P6002-2
P6502 (TO SYSTEM CTL)
1 C.REMOTE Ⓗ P6010-1
2 POWER OFF RQ Ⓛ P6010-2
3 POWER OFF CMD Ⓛ P6010-3
4 CLOCK(2) P6010-4
5 DATA(2) P6010-5
6 POWER ON Ⓗ P6010-6
7 12V P6010-7
8 LED 5V P6010-8
9 9V OFF Ⓛ P6010-9
10 DEW Ⓛ P6010-10
C6501 0.01
R6517 10K
REC STOP EJECT
D6505 SW6504
D6506 SW6505
D6507 SW6506
A.DUB REW SLOW C.MEMO
D6508 SW6507
D6509 SW6508
D6510 SW6509
D6511 SW6510
PLAY FF PAUSE STILL C.RESET
D6512 SW6511
D6513 SW6512
D6514 SW6513
D6515 SW6514
R6503 100K
R6504 100K
R6505 100K
D6503 MA151A
C6502 50V2.2
R6535 270
C6512 0.01
R6508 56K
R6509 100K
D6504 HZ3BLL
Q6502 2SD601 (RESET OUT)
C6503 33P
R6507 82K (G)
R6510 1K
R6511 100K
P6503
1 DATA(2)
2 GND
3 CLOCK(2)
4 LED 5V
REMOTE CONTROL JACK
Q6503 2SD602 (RorS) (SERIAL DATA OUT)
Q6504 2SD602 (RorS) (SERIAL DATA OUT INHIBIT)
C6507 220P
R6515 15K
IC6501 µPD7503G
NC
P32 KEY SCAN IN 2
P31 KEY SCAN IN 1
P30 KEY SCAN IN 0
SI SERIAL DATA IN
SO SERIAL DATA OUT
SCK SERIAL CLOCK
P63 SO INHIBIT Ⓗ
P62 DEW Ⓛ
P61 POWER OFF CMD Ⓛ
P60 POWER SW ON Ⓛ
P53 DEW Ⓗ
P52 WARNING LED Ⓗ
P51 POWER ON Ⓗ
P50 POWER OFF RQ Ⓛ
P43 REC Ⓗ
P42 A.DUB Ⓗ
P41 PLAY Ⓗ
P40 PAUSE/STILL Ⓗ
X2
X1
P33 P10 CLK Ⓗ P11 P12 P13 CL2 VDD CL1 RESET INT1 S0
VSS VLC3 VLC2 VLC1 VDD COM3 COM2 COM1 COM0 S23 S22
S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21
R6516 10K
R6536 22K
R6513 22K
R6540 10K
R6541 10K
R6542 4700
C6504 0.01
C6505 0.01
C6506 0.01
R6525 180K
R6526 100K
R6527 100K
R6528 100K
LCD UNIT
S0 S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 COM0 COM1 COM2
BACK LIGHT
VLL0020
R6502 220
D6502 LN28CALS
AUTO OFF
QR6506 UN2214 (LED ON/OFF)
R6521 220
D6519 LN28CALS
REC
QR6505 UN2214 (LED ON/OFF)
R6520 220
D6518 LN28CALS
A.DUB
QR6504 UN2214 (LED ON/OFF)
R6519 220
D6517 LN28CALS
PLAY
QR6503 UN2214 (LED ON/OFF)
R6518 220
D6516 LN28CALS
PAUSE
QR6502 UN2214 (LED ON/OFF)
10K 47K
R6537 270
R6514 820
R6524 220
IC6503 MN4066BS
PIN ⑦:GND
PIN ⑭:LED 5V
R6523 22K
Q6505 2SD601 (DEW Ⓗ:ON)

REF. NO. 4200 Series .... RECORD MODE
REF. NO. 4700 Series .... STOP MODE
REF. NO. 6500 Series .... STOP MODE

5 6 7 8 9 10 11 12 13 14 15

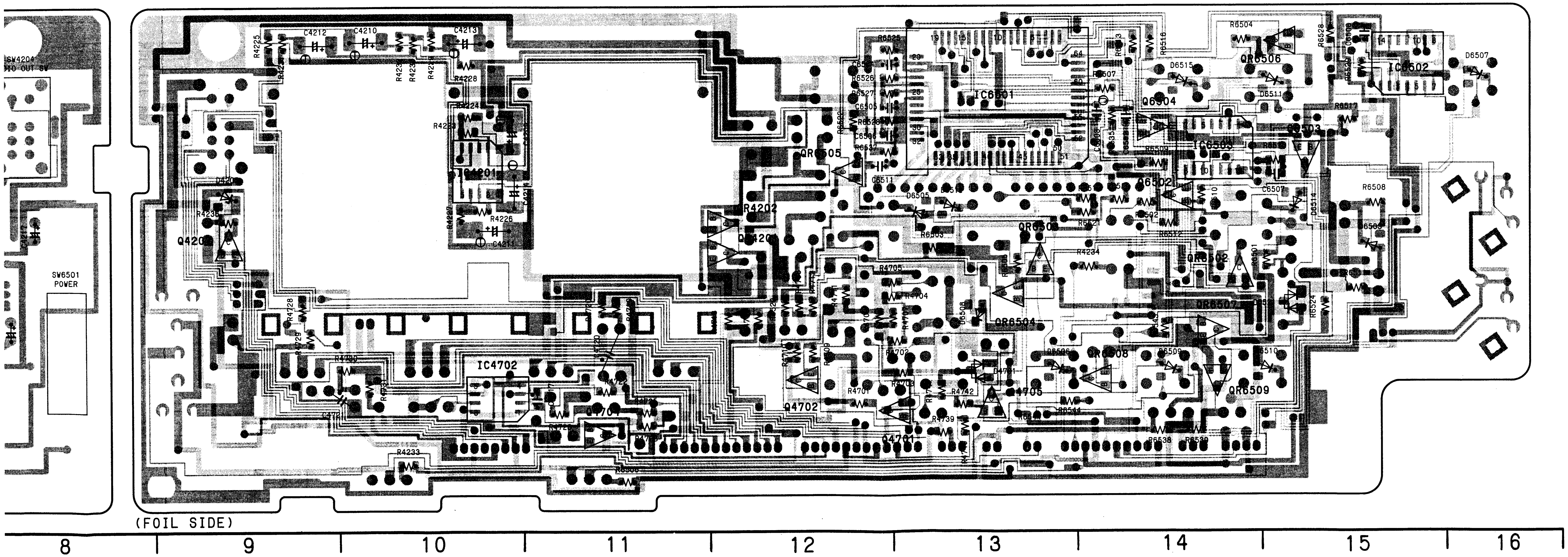
FRONT C.B.A. (VEP06338B)



LCD UNIT
JACK C.B.
LINE OUT
HEAD PHONE
P4703
J4701
R4751
R4752
(COMPONENT SIDE)
C
B
A
1
2
3
4
5
6
7
8
R6534
R6533
R6530
R6536
D6523
D6522
SW6508 EJECT
R6532
C6509
R6531
Q6505
SW6510 C.MEMO
SW6514 C.RESET
SW6503 LIGHT
PL4201
PL4202
SW4204 AUDIO OUT SW
L4202
C4215
C4216
D4202
D4203
D4204
D4201
VR4207 TRACKING
VR4208 SLOW TRACKING
Q6501
SW6512 PAUSE
D6502
AUTO OFF
SW6511 PLAY
SW6504 REC
VR4205
VR4206
CH2 METER LEVEL ADJ
D6504
D4206
DOLBY
C6501
D6520
C4708
C4701
IC4701
C4702
CH1 METER LEVEL ADJ
D6518
Q4704
CH1 NORMAL AUDIO LEVEL
CH1 HD AUDIO LEVEL
CH2 NORMAL AUDIO LEVEL
CH2 HD AUDIO LEVEL
SW6501 POWER
VR4202
VR4204
VR4201
VR4203
C4709
P4207
C4208
SW6509 SLOW
SW6506 REW
C6514
SW6505 STOP
SW6507 A.DUB
C4705
C4719
D6513
Q6506
Q4703
TP4701
TP4703 (GND)
C4710
C4711
C4714
C4713
C4712
C4715
R4727
R4736
R4735
R4732
P6503
P6502
P4202
P6501
P4701
P4201
P4203
SW6502 CAMERA REMOTE SW
SW4201 LIMITER SW
OFF
ON
(COMPONENT SIDE)
(FOIL SIDE)
Q4201

FRONT C.B.A.							
Transistors		**Transistors & Resistors**		**Integrated Circuits**		**Adjustments**	
Q4207	B-9 Ⓕ	QR4201	B-12 Ⓕ	IC4201	B-10 Ⓕ	VR4201	B-7 ©
Q4701	A-12 Ⓕ	QR4202	B-12 Ⓕ	IC4701	B-4 ©	VR4202	B-5 ©
Q4702	A-12 Ⓕ	QR6502	B-14 Ⓕ	IC4702	B-10 Ⓕ	VR4203	B-7 ©
Q4703	A-5 ©	QR6503	B-13 Ⓕ	IC6501	C-13 Ⓕ	VR4204	B-6 ©
Q4704	A-11 Ⓕ	QR6504	B-13 Ⓕ	IC6502	C-15 Ⓕ	VR4205	B-5 ©
Q4705	A-13 Ⓕ	QR6505	B-12 Ⓕ	IC6503	C-14 Ⓕ	VR4206	B-5 ©
Q6501	B-2 ©	QR6506	C-14 Ⓕ	**Test Points**		VR4207	B-1 ©
Q6502	B-14 Ⓕ	QR6507	A-14 Ⓕ			VR4208	B-1 ©
Q6503	C-15 Ⓕ	QR6508	A-14 Ⓕ	TP4701	A-5 ©		
Q6504	C-14 Ⓕ	QR6509	A-14 Ⓕ	TP4702	A-6 ©		
Q6505	C-2 ©			TP4703	A-6 ©		
Q6506	A-3 ©						

ADDRESS INFORMATION
© ··· COMPONENT SIDE
Ⓕ ··· FOIL SIDE


SW4204
SW6501
POWER
C4212
C4210
C4213
R4225
R4228
R4224
IC4201
R4226
C4211
R4227
Q4207
R4202
QR4201
QR6505
IC6501
C6511
D6505
R6503
QR6503
R4705
R4704
QR6504
R4702
R4701
R4742
R4739
Q4701
Q4702
Q4705
IC4702
R4728
R4729
R4233
R6506
R6523
R6526
R6527
R6507
R6516
R6504
D6515
QR6506
Q6504
D6511
IC6503
R6517
Q6503
IC6502
D6507
R6528
QR6502
R6502
R6512
R6508
R6509
C6507
D6514
R4234
R6501
R6524
QR6507
R6510
QR6508
QR6509
R6538
R6539
R6541
(FOIL SIDE)
8
9
10
11
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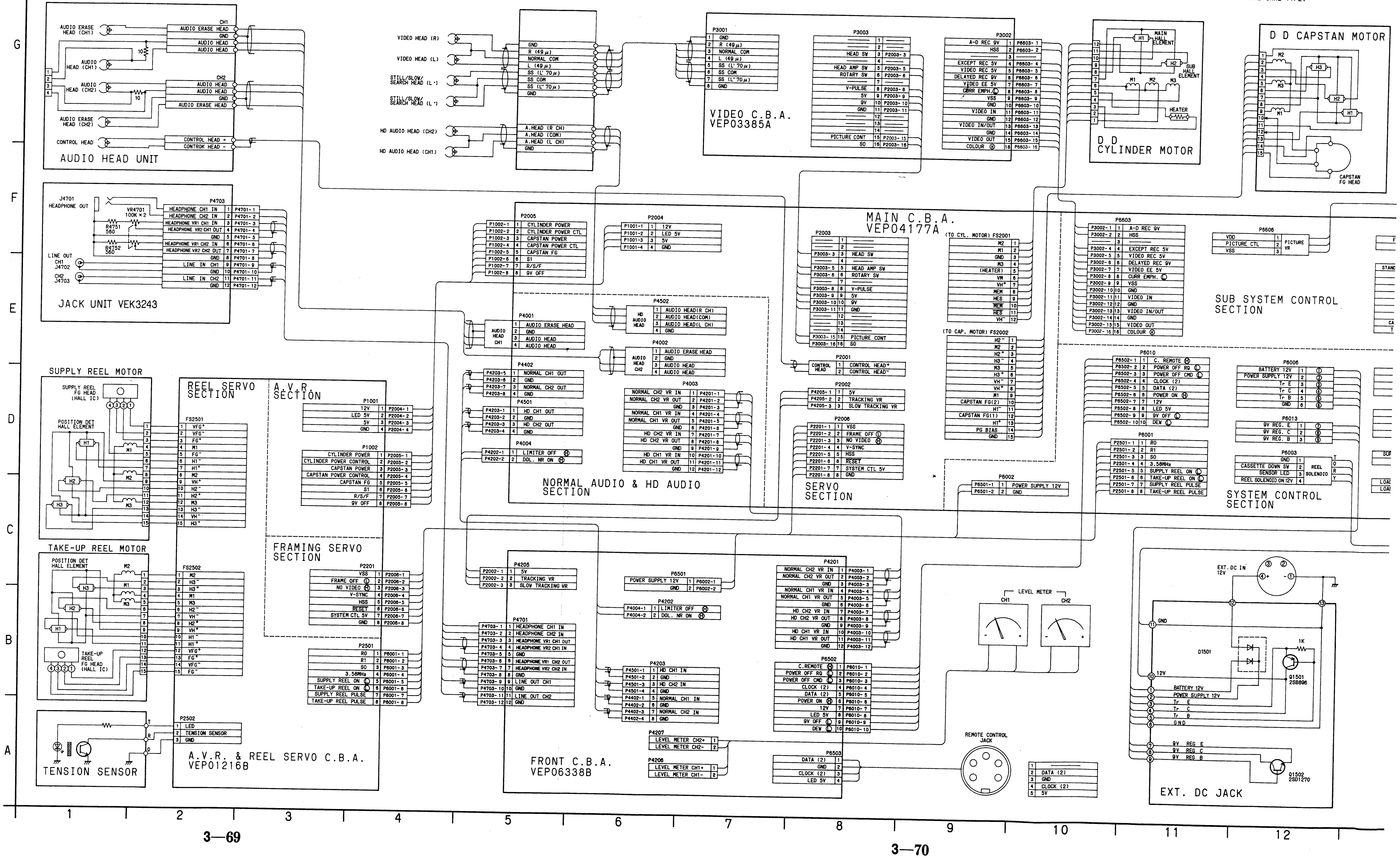
15
16

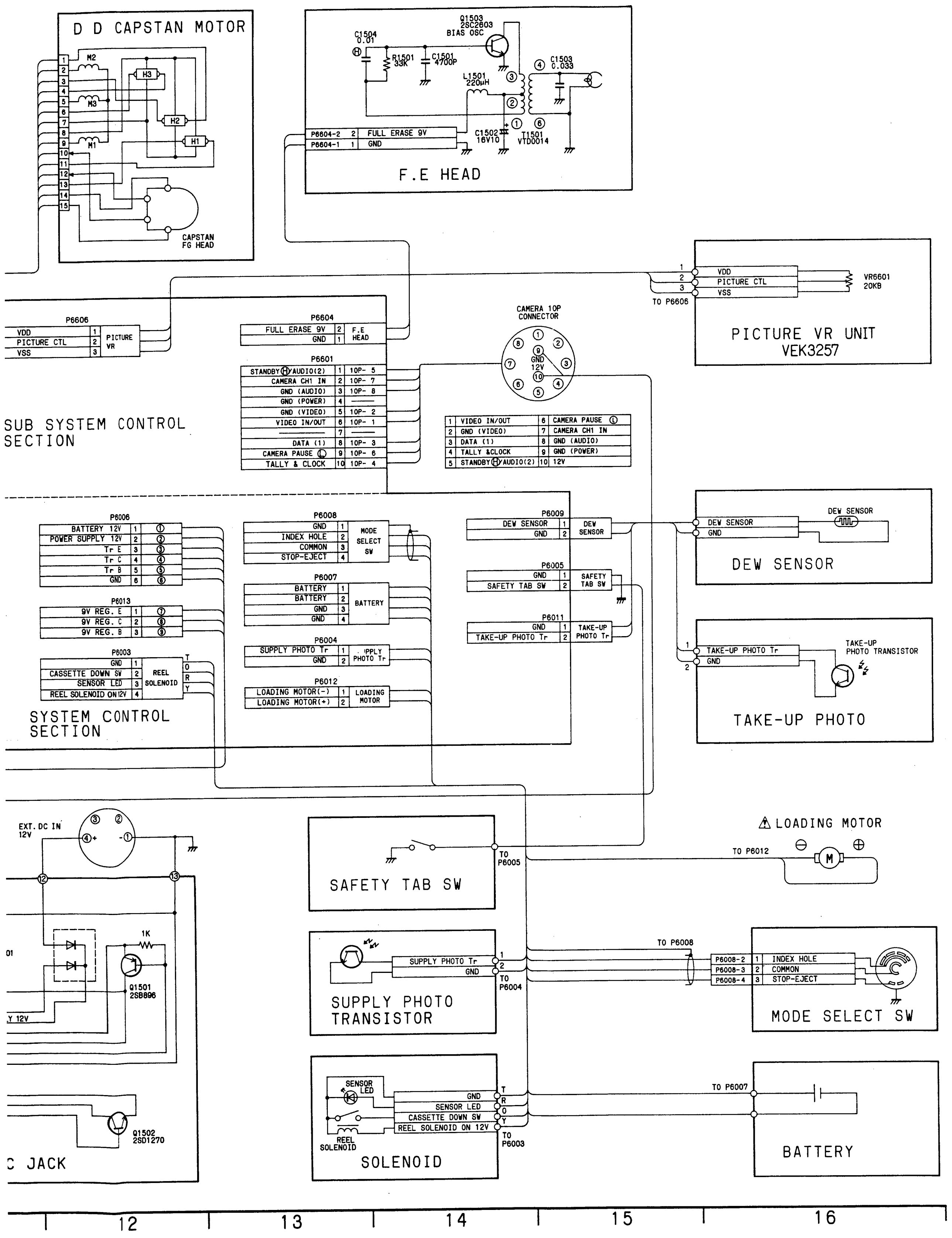
INTERCONNECTION SCHEMATIC DIAGRAM

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK⚠HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS. USE ONLY THE SAME TYPE.


AUDIO HEAD UNIT
AUDIO ERASE HEAD (CH1)
AUDIO HEAD (CH1)
AUDIO HEAD (CH2)
AUDIO ERASE HEAD (CH2)
CONTROL HEAD
JACK UNIT VEK3243
J4701 HEADPHONE OUT
LINE OUT CH1 J4702
CH2 J4703
SUPPLY REEL MOTOR
SUPPLY REEL FG HEAD (HALL IC)
POSITION DET HALL ELEMENT
TAKE-UP REEL MOTOR
TAKE-UP REEL FG HEAD (HALL IC)
TENSION SENSOR
REEL SERVO SECTION
A.V.R. SECTION
FRAMING SERVO SECTION
A.V.R. & REEL SERVO C.B.A. VEP01216B
VIDEO HEAD (R)
VIDEO HEAD (L)
STILL/SLOW/SEARCH HEAD (L')
HD AUDIO HEAD (CH2)
HD AUDIO HEAD (CH1)
VIDEO C.B.A. VEP03385A
MAIN C.B.A. VEP04177A
NORMAL AUDIO & HD AUDIO SECTION
SERVO SECTION
FRONT C.B.A. VEP06338B
LEVEL METER
CH1
CH2
REMOTE CONTROL JACK
D D CYLINDER MOTOR
MAIN HALL ELEMENT
SUB HALL ELEMENT
HEATER
D D CAPSTAN MOTOR
CAPSTAN FG HEAD
SUB SYSTEM CONTROL SECTION
SYSTEM CONTROL SECTION
EXT. DC IN 12V
EXT. DC JACK
D1501
Q1501 2SB896
Q1502 2SD1270
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12

HE SPECIAL CHARACTERISTICS FOR SAFETY.
ONLY THE SAME TYPE.

NOTE: DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST. AND MAY BE SLIGHTLY DIFFERENT OR AMENDED SINCE THIS DRAWING WAS PREPARED.


D D CAPSTAN MOTOR
M2
H3
M3
H2
H1
M1
CAPSTAN FG HEAD
Q1503 2SC2603 BIAS OSC
C1504 0.01
R1501 33K
C1501 4700P
L1501 220uH
C1503 0.033
C1502 16V10
T1501 VTD0014
P6604-2 2 FULL ERASE 9V
P6604-1 1 GND
F.E HEAD
VDD
PICTURE CTL
VSS
TO P6605
VR6601 20KB
PICTURE VR UNIT
VEK3257
P6606
PICTURE VR
P6604
FULL ERASE 9V
F.E HEAD
P6601
STANDBY ⊕ AUDIO(2)
CAMERA CH1 IN
GND (AUDIO)
GND (POWER)
GND (VIDEO)
VIDEO IN/OUT
DATA (1)
CAMERA PAUSE
TALLY & CLOCK
CAMERA 10P CONNECTOR
12V
SUB SYSTEM CONTROL SECTION
P6006
BATTERY 12V
POWER SUPPLY 12V
Tr E
Tr C
Tr B
GND
P6008
INDEX HOLE
COMMON
STOP-EJECT
MODE SELECT SW
P6009
DEW SENSOR
P6005
SAFETY TAB SW
P6011
TAKE-UP PHOTO Tr
P6013
9V REG. E
9V REG. C
9V REG. B
P6007
BATTERY
P6004
SUPPLY PHOTO Tr
P6003
CASSETTE DOWN SW
SENSOR LED
REEL SOLENOID ON 12V
REEL SOLENOID
P6012
LOADING MOTOR(-)
LOADING MOTOR(+)
LOADING MOTOR
SYSTEM CONTROL SECTION
DEW SENSOR
TAKE-UP PHOTO TRANSISTOR
TAKE-UP PHOTO
EXT. DC IN 12V
1K
Q1501 2SB896
Q1502 2SD1270
C JACK
SAFETY TAB SW
TO P6005
TO P6012
TO P6008
P6008-2 1 INDEX HOLE
P6008-3 2 COMMON
P6008-4 3 STOP-EJECT
SUPPLY PHOTO TRANSISTOR
TO P6004
MODE SELECT SW
TO P6007
BATTERY
SENSOR LED
REEL SOLENOID
SOLENOID
TO P6003
12
13
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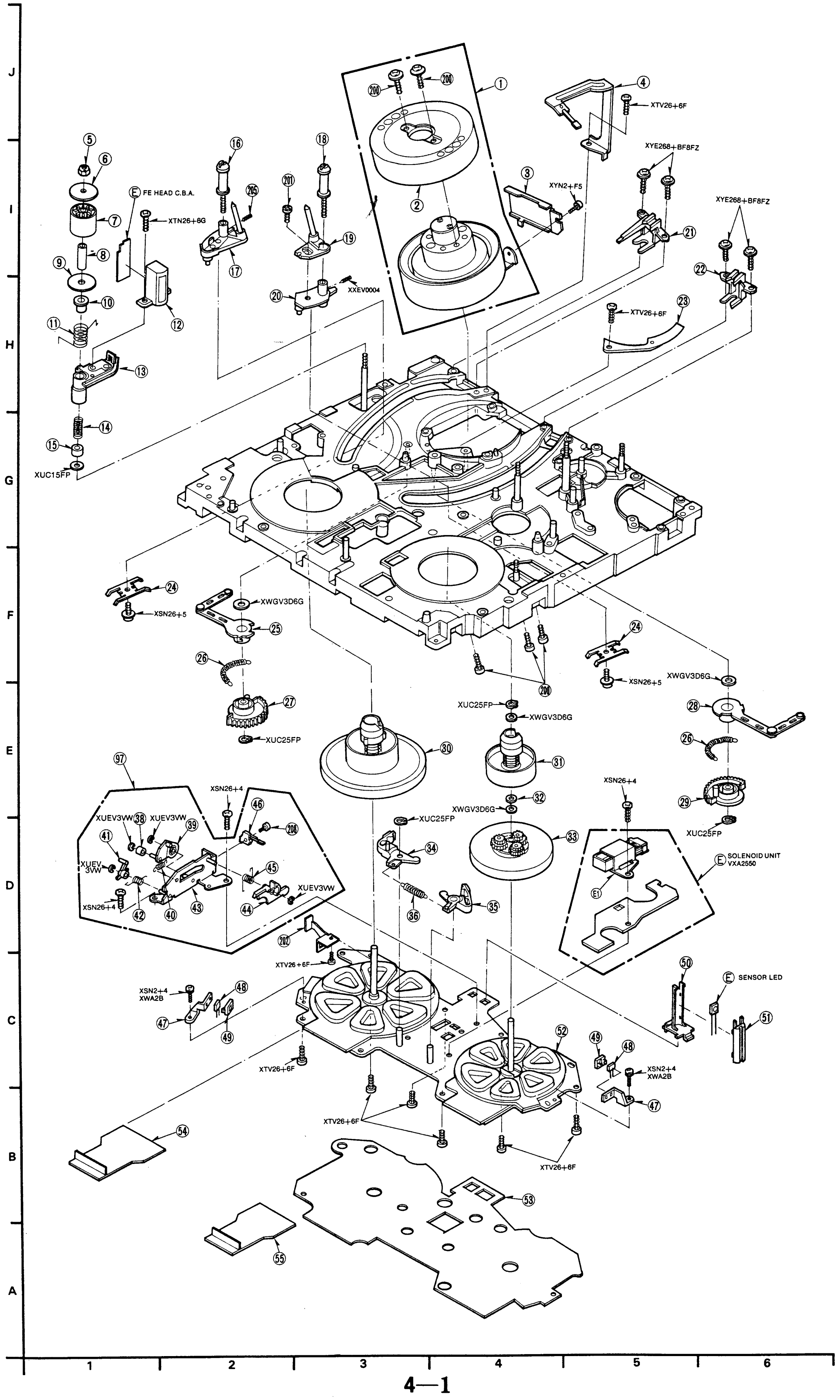
16

EXPLODED VIEWS

❶ *Transport Section*


J
I
H
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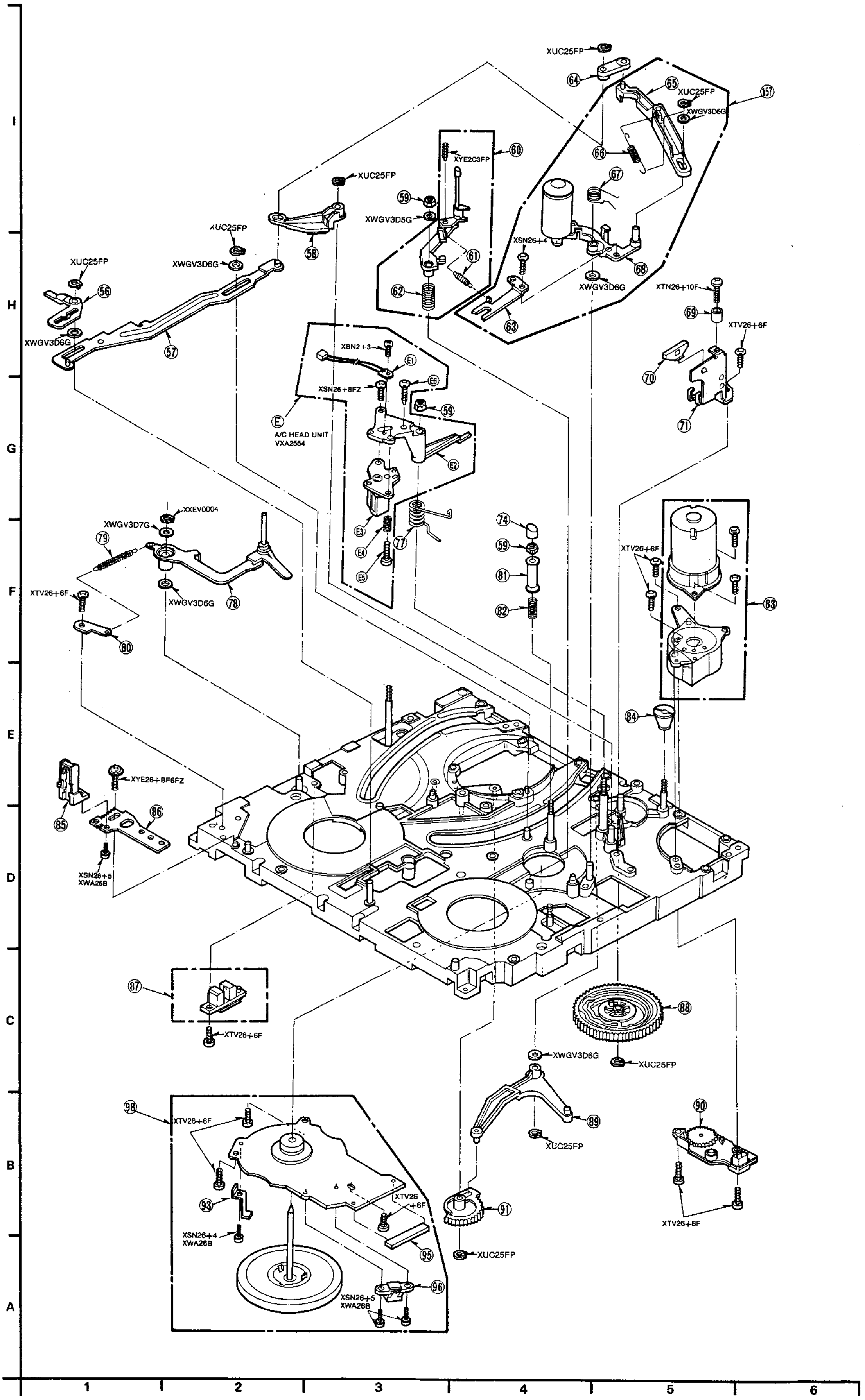
6
E FE HEAD C.B.A.
XTN26+8G
XXEV0004
XTV26+6F
XYE268+BF8FZ
XYN2+F5
XUC15FP
XSN26+5
XWGV3D6G
XUC25FP
XSN26+4
XUEV3VW
XTV26+6F
XSN2+4
XWA2B
E SOLENOID UNIT VXA2550
E SENSOR LED

❷ Moving Mechanism Section


XUC25FP
(64)
(65)
XUC25FP
XWGV3D6G
(157)
(66)
(67)
(60)
XYE2C3FP
XUC25FP
(59)
XWGV3D5G
(58)
XUC25FP
XUC25FP
XWGV3D6G
(56)
(57)
XWGV3D6G
(61)
(62)
(63)
XSN26+4
(68)
XWGV3D6G
XTN26+10F
(69)
XTV26+6F
(70)
(71)
XSN2+3
(E1)
(E6)
XSN26+8FZ
(59)
(E)
A/C HEAD UNIT
VXA2554
(E2)
(E3)
(E4)
(E5)
(77)
(74)
(59)
(81)
(82)
XXEV0004
XWGV3D7G
(79)
(78)
XWGV3D6G
XTV26+6F
(80)
XTV26+6F
(83)
(84)
XYE26+8F6FZ
(85)
(86)
XSN26+5
XWA26B
(87)
XTV26+6F
(88)
XWGV3D6G
XUC25FP
(89)
XUC25FP
(90)
XTV26+8F
(98)
XTV26+6F
(93)
XSN26+4
XWA26B
XTV26
+6F
(95)
(91)
XUC25FP
(96)
XSN26+5
XWA26B
I
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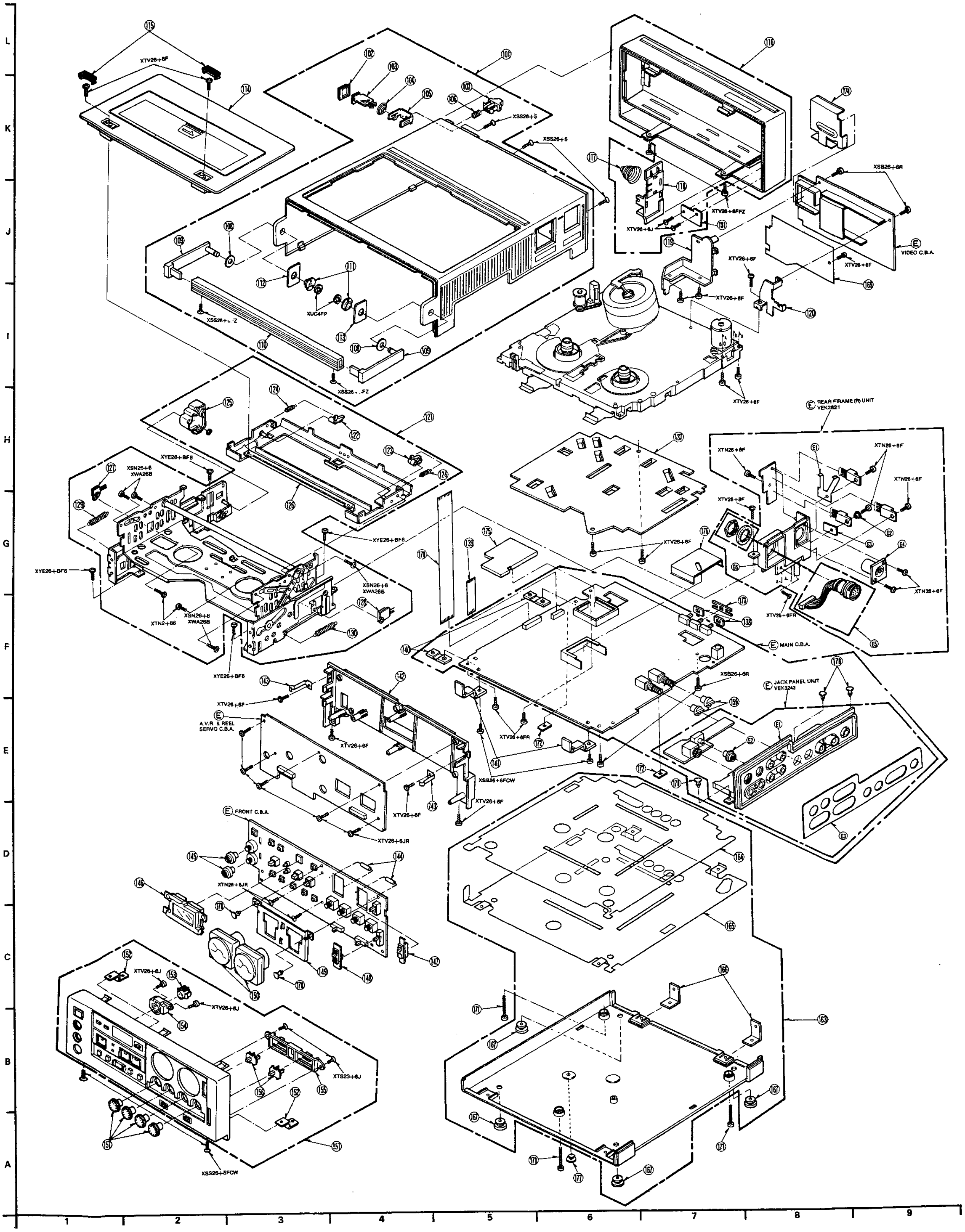
❸ *Chassis Parts, Cassette Up Mechanism & Casing Parts Section*


L
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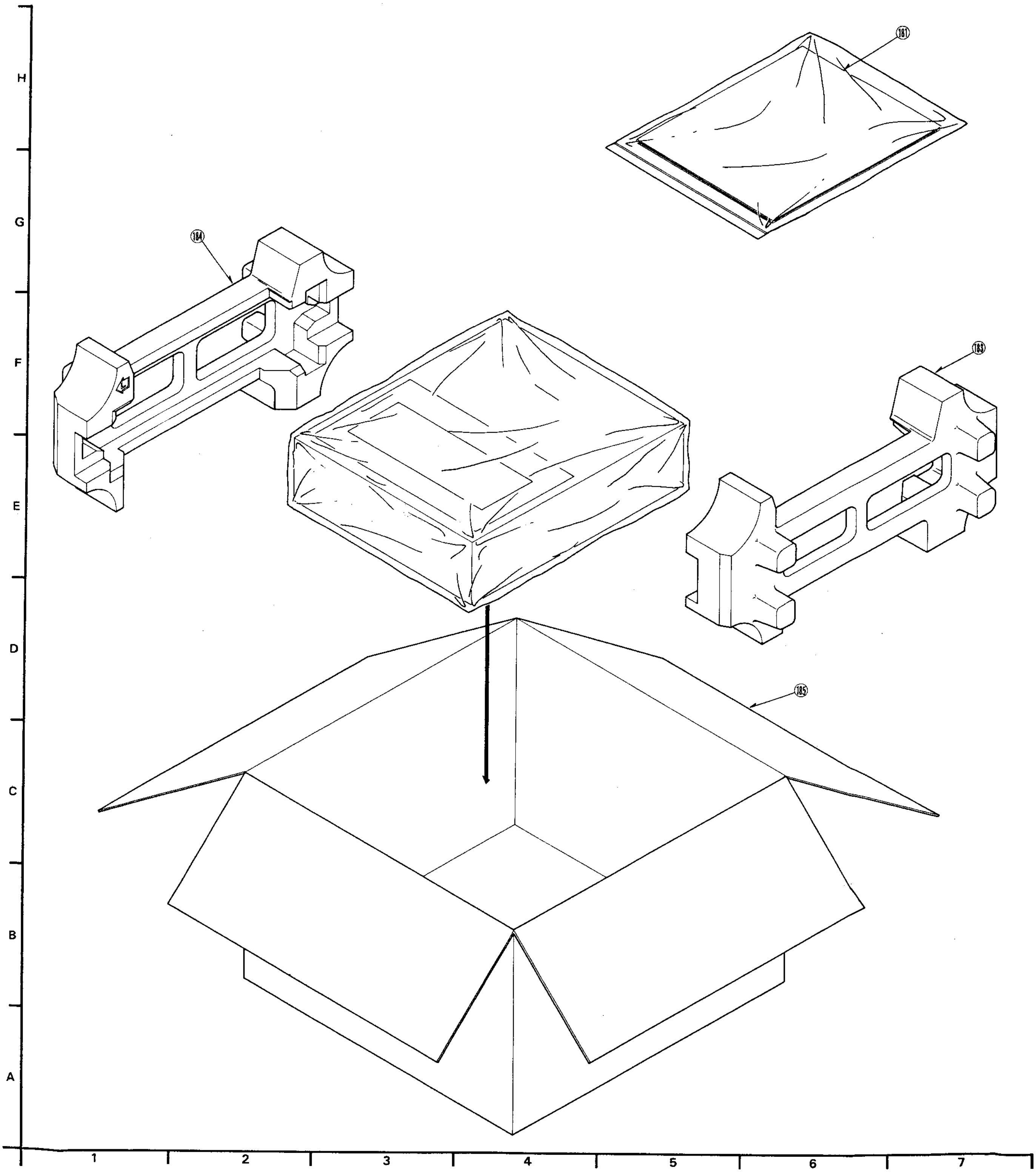
⑪⑮
XTV26+8F
⑪④
⑩①
⑩②
⑩③
⑩④
⑩⑤
⑩⑥
⑩⑦
XSS26+5
⑪⑥
⑰④
XSS26+5
⑪⑦
⑪⑧
XSB26+6R
XTV26+6FFZ
XTV26+6J
⑬①
⑪⑨
Ⓔ VIDEO C.B.A.
XTV26+6F
⑯⑨
⑩⑧
⑩⑨
⑪②
⑪①
XUC4FP
⑪③
⑪⓪
XSS26+6FZ
XTV26+6F
⑫⓪
XTV26+6F
Ⓔ REAR FRAME (R) UNIT VEK2821
⑫④
⑫⑤
⑫①
⑫②
⑫③
⑫⑥
⑬⑦
XTN26+6F
Ⓔ1
XTN26+6F
XYE26+BF8
⑫⑦
XSN26+6
XWA26B
⑫⑨
XTV26+6F
XYE26+BF8
⑰⑤
⑬⑨
⑰⑧
XTV26+6F
⑰⑥
Ⓔ2
Ⓔ3
Ⓔ4
Ⓔ6
XTN26+6F
XSN26+6
XWA26B
⑫⑧
XTN2+86
XSN26+6
XWA26B
⑬⓪
⑰③
⑬⑧
XTV26+6FR
Ⓔ MAIN C.B.A.
Ⓔ5
⑭⓪
XYE26+BF8
⑭③
⑭②
⑰⑨
XSB26+6R
Ⓔ JACK PANEL UNIT VEK3243
XTV26+6F
Ⓔ A.V.R. & REEL SERVO C.B.A.
⑮⑧
XTV26+6F
XTV26+6FR
⑰②
Ⓔ1
Ⓔ2
⑭①
XSB26+6FCW
⑰②
⑰④
XTV26+6F
⑭③
XTV26+6F
Ⓔ3
Ⓔ FRONT C.B.A.
XTV26+6JR
⑭⑤
⑭④
⑯④
⑭⑥
XTN26+6JR
⑰⓪
⑯⑤
⑭⑨
⑭⑧
⑭⑦
⑮⓪
⑰⓪
⑮②
XTV26+6J
⑮③
⑮④
XTV26+6J
⑯⑥
⑰①
⑯③
⑯⑦
XTS23+6J
⑮⑥
⑮⑤
⑮②
⑯⑦
⑯⑦
⑮⑦
⑮①
⑰①
XSS26+5FCW
⑰①
⑰⑦
⑯⑦

❹ Packing Parts Section


(181)
(184)
(183)
(185)
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ORDER NO. VRD8701201

(Date of issue : FEB, 1987)

Video Cassette Recorder

Replacement Parts List

National/Panasonic VHS Hi-Fi
Professional/Industrial Video
PAL

AG-6400-B -E -EN

Notes :

1. ● Be sure to make your orders of replacement parts according to this list.
   ● " 〈R〉" in Remarke column indicates recommended parts.
   ● " 〈M〉" in Remarke column indicates needed in the periodical maintenance.
2. IMPORTANT SAFETY NOTICE
   Components identified by " ! " have special characteristics important for safety.
   When replacing any of these components, use only the original ones.
   Meaning of simbol ! on this parts list is exactly same as simbol ⚠ on Schematic and Circuit Board Diagrams.
3. Unless otherwise specified;
   All resistors are in OHMS (Ω), K=1,000Ω, M=1,000KΩ.
4. ITEM NUMBERS WITH CAPITAL LETTER E
   Item numbers with capital letter E (Example: E1, E2, ...) in Ref. No. column mean that parts so listed are shown with the E item numbers in the exploded viws.
5. C.B.A. marked with "■" show below the main assembled parts.
6. When ordering parts, use part No. only from Part No. column.

CONTENTS

SERVICING FIXTURES & TOOLS LIST 1
MECHANICAL REPLACEMENT PARTS LIST 2
ELECTRICAL REPLACEMENT PARTS LIST 4
  A.V.R. & REEL SERVO C.B.A. 4
  MAIN C.B.A. 5
  JACK PANEL UNIT 12
  VIDEO C.B.A. 12
  FRONT C.B.A. 14
  FE HEAD C.B.A. 16
  REAR FRAME (R) UNIT 16
  A/C HEAD UNIT 17
  SOLENOID C.B. UNIT 17

1. SERVICING FIXTURES & TOOLS LIST

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
		VFM8180HMD	VHS Alignment Tape	1	
		VFK0137	Post Adj. Screwdriver	1	
		VFK0132	Back Tension Meter	1	
			(Tentelometer,		(T2-H7-UM)
			Made in U.S.A.)		
		VFK0191	Post Adj. Plate	1	
		VFK0133	Dial Torque Gauge	1	
		VFK0180	Plastic Clamper Only	1	
		VFK0134	Adaptor for VFK0133	1	
		VFK0190	Reel Table Height Fixture	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
		VFK0189	H-Position Adj. Fixture	1	
		VFK0136	Fine Adj. Screwdriver	1	
			(3mm Phi)		
		VFK0144	Retaining Ring Remover	1	
			(3mm Phi)		
		VFK0145	Retaining Ring Remover	1	
			(4mm Phi)		
		VFK0146	Hex.Wrench (0.9mm)	1	
		VFK76	Hex.Wrench (1.5mm)	1	
		MOR265	Morlytone Grease	1	
		VFK27	Head Cleaning Stick	1	

2. MECHANICAL REPLACEMENT PARTS LIST

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
1(1)		VEG0475	DD CYLINDER UNIT	1	<R> <!> <M>
2(1)		VEH0340	UPPER CYLINDER UNIT	1	<R> <M>
3(1)		VSC1142	SHIELD BOARD	1	
4(1)		VXS0060	EARTH PLATE UNIT	1	
5(1)		VHN0023	NUT	1	
6(1)		VMX0692	UPPER LIMITER	1	
7(1)		VDP0970	LIMITER ROLLER	1	
8(1)		VMX0288	COLLAR (B)	1	
9(1)		VMX0679	LOWER LIMITER	1	
10(1)		VDB0721	LIMITER STAND	1	
11(1)		VMB1231	FE HEAD LEVER SPRING	1	
12(1)		VBS0031	FE HEAD	1	<R> <M>
13(1)		VML1569	FE HEAD LEVER	1	
14(1)		VMB1239	LIMITER SPRING	1	
15(1)		VMX0680	COLLAR (A)	1	
16(1)		VXP0302A	ROLLER POST UNIT (S)	1	
17(1)		VXA2039	SHAFT HOLDER (S) UNIT	1	
18(1)		VXP0761	ROLLER POST UNIT (T)	1	
19(1)		VXA2041	INCLIND BASE (T) UNIT	1	
20(1)		VXA2042	SHAFT HOLDER (T) UNIT	1	
21(1)		VMD0613	POST STOPPER (S)	1	
22(1)		VMD0614	POST STOPPER (T)	1	
23(1)		VMD0609	INCLIND SUPPORT	1	
24(1)		VMA6422	SHAFT HOLDER PLATE	2	
25(1)		VXL1193	LOADING ARM (S) UNIT	1	
26(1)		VMB1232	LOADING SPRING	2	
27(1)		VXP0561	LOADING GEAR (S) UNIT	1	
28(1)		VXL1191	LOADING ARM (T) UNIT	1	
29(1)		VXP0560	LOADING GEAR (T) UNIT	1	
30(1)		VXR0122	SUPPLY REEL TABLE UNIT	1	<R> <M>
31(1)		VXR0121	TAKEUP REEL TABLE UNIT	1	<R> <M>
32(1)		VMX0708D	THRUST WASHER	1	
33(1)		VXP0564	TAKEUP ROTOR UNIT	1	<R>
34(1)		VX20173	MAIN BRAKE (S) UNIT	1	<R> <M>
35(1)		VX20174	MAIN BRAKE (T) UNIT	1	<R> <M>
36(1)		VMB1241	BRAKE SPRING	1	
38(1)		VDP0969	LOCK ROLLER	1	
39(1)		VXA2035	LOCK BOARD UNIT	1	
40(1)		VMB1227	LOCK BOARD SPRING	1	
41(1)		VML1562	LOCK LEVER (B)	1	
42(1)		VMB1225	LOCK LEVER (B) SPRING	1	
43(1)		VXA2034	LOCK PLATE UNIT	1	
44(1)		VML1561	LOCK LEVER (A)	1	
45(1)		VMB1226	LOCK LEVER (A) SPRING	1	
46(1)		VSH0019	REEF SWITCH	1	<R>
47(1)		VMD0611	FG SUPPORT (1)	2	
48(1)		HW300B	HALL IC	2	<R>
49(1)		VMD0621	FG SUPPORT (2)	2	
50(1)		VMX0682	LED HOLDER (R)	1	
51(1)		VMX0683	LED HOLDER (L)	1	
52(1)		VXA2119	STATOR BASE UNIT	1	<R> <!>
53(1)		VM20565	INSULATE SHEET	1	
54(1)		VWJ0158	SUPPLY REEL MOTOR FPC	1	
55(1)		VWJ0159	TAKEUP REEL MOTER FPC	1	
56(2)		VDK0009	BRAKE CAM	1	
57(2)		VXL1199	MAIN LEVER UNIT	1	
58(2)		VXL1198	BRAKE ARM UNIT	1	
59(2)		VHN0023	NUT	3	
60(2)		VXL1196	P5 ARM UNIT	1	
61(2)		VMB1237	PIN PRESSURE SPRING	1	
62(2)		VMB1299	P5 SPRING	1	
63(2)		VML1565	P5 KICK LEVER	1	
64(2)		VML1563	GUIDE LEVER	1	
65(2)		VMM0130	PRESSURE LEVER	1	
66(2)		VMB1228	PRESSURE SPRING	1	
67(2)		VMB1238	PRESSURE ARM SPRING	1	
68(2)		VXL1229	PRESSURE ARM (1) UNIT	1	<R> <M>
69(2)		VDB0740	STOPPER BOSS	1	
70(2)		VMA6413	OPENER COVER	1	
71(2)		VMA6421	OPENER ANGLE	1	
74(2)		VMD0619	P4 POST CAP	1	
77(2)		VMB1240	A/C HEAD HEIGHT SPRING	1	
78(2)		VML1200	TENSION ARM UNIT	1	
79(2)		VMB1230	TENSION ARM SPRING	1	
80(2)		VMD0604	TENSION ARM SPRING TIE (C)	1	
81(2)		VMX0681	POST SLEEVE	1	
82(2)		VMB1239	LIMITER SPRING	1	
83(2)		VEM0255	LOADING MOTOR UNIT	1	<R> <!> <M>
84(2)		VHN0039	ADJUST NUT	1	
85(2)		VSH0023	SAFETY TAB SWITCH	1	<R>
86(2)		VMA6414	SASFETY TAB BASE	1	
87(2)		VEK2116	TENSION SENSOR UNIT	1	
88(2)		VXP0562	CAM GEAR UNIT	1	<R> <M>
89(2)		VXL1189	LOCK ARM UNIT	1	
90(2)		VSS0099	MODE SELECT SW	1	<R> <M>
91(2)		VDG0161	LOCK GEAR	1	
92(2)		VEK2113	CAPSTAN STATOR UNIT	1	<R> <!>
93(2)		VMA6470	STOPPER	1	
94(2)		VXP0557	CAPSTAN MOTOR UNIT	1	<R>
95(2)		VJS1403	CAPSTAN STATOR CONNECTOR	1	
96(2)		VBK0041	MR.FG SENSOR	1	
97(2)		VXA2033	CASSETTE LOCK UNIT	1	
98(2)		VEM0206	DD CAPSTAN UNIT	1	<R> <!> <M>
101(3)		VYK1281	TOP CASE UNIT	1	<R>
102(3)		VGU3036	BATTERY EJECT BUTTON (A)	1	<R>
103(3)		VGQ0614	BATTERY EJECT BUTTON (B)	1	<R>
104(3)		VMB1220	BATTERY EJECT SPRING	1	
105(3)		VMA6400	EJECT BUTTON ANGLE	1	
106(3)		VMB1221	BATTERY STOPPER SPRING	1	<R>
107(3)		VGQ0609	BATTERY STOPPER	1	<R>
108(3)		VGQ0328	HANDLE WASHER	2	
109(3)		VKH0067	HANDLE ARM	1	<R>
110(3)		VKH0150	HANDLE BAR	1	<R>
111(3)		VGQ0331	HANDLE SPACER	1	<R>
112(3)		VMA5910	HANDLE ANGLE (L)	1	<R>
113(3)		VMA5906	HANDLE ANGLE (R)	1	<R>
114(3)		VGP1614	CASSETTE COVER	1	<R> FOR AG-6400-E/B
114(3)		VGP1537	CASSETTE COVER	1	<R> FOR AG-6400-EN
115(3)		VGK1222	CASSETTE COVER CAP	2	<R>
116(3)		VYK1460	BATTERY CASE UNIT	1	<R> FOR AG-6400-E/B
116(3)		VYK1461	BATTERY CASE UNIT	1	<R> FOR AG-6400-EN
117(3)		VMB1219	BATTERY SPRING	1	
118(3)		VJF0189	BATTERY CATCHER	1	<R>
119(3)		VMD0851	REAR FRAME (L)	1	
120(3)		VMP0939	VIDEO P.C. BOARD ANGLE	1	
121(3)		VXA2551	CASSETTE COMPARTMENT UNIT	1	<R>
122(3)		VXL1225	CASSETTE PRESSURE LEVER (L)	1	
123(3)		VXL1226	CASSETTE PRESSURE LEVER (R)	1	
124(3)		VMB1222	CASSETTE SUPPORT SPRING	1	
125(3)		VDG0169	DAMPER	1	
126(3)		VXA2118	CASSETTE HOLDER	1	
127(3)		VXA2588	SUPPLY PHOTO TR. UNIT	1	<R>
128(3)		VXA2552	TAKE UP PHOTO TR.UNIT	1	<R>
129(3)		VMB1224	HOLDER SPRING (L)	1	
130(3)		VMB1223	HOLDER SPRING (R)	1	
131(3)		VEK3257	PICTURE VR UNIT	1	<R>
137(3)		VFB0062	MECHANISM COVER	1	
138(3)		VGF0189	BRIND PLATE (A)	2	
139(3)		VWJ12A080MM	FLEXIBLE JAMPER	1	<R>
140(3)		VKC0052	HINGE	2	
141(3)		VKC0281	HINGE	2	
142(3)		VMD0849	FRONT FRAME	1	
143(3)		VMC0190	SPRING (A)	2	
144(3)		VLL0041	METER LAMP	2	
145(3)		VGU3046	VR KNOB	2	
146(3)		VLL0020	L.C.D. UNITE	1	
147(3)		VGU3040	AUDIO METER SELECT KNOB	1	
148(3)		VXU0653	POWER SWITCH KNOB	1	
149(3)		VMP0938	METER ANGLE	1	
150(3)		VSE0068	AUDIO LEVEL METER	2	
151(3)		VYP1893	FRONT PANEL UNIT	1	FOR AG-6400-E/B
151(3)		VYP1894	FRONT PANEL UNIT	1	FOR AG-6400-EN
152(3)		VMP0937	FRONT MOUNT ANGLE	2	
153(3)		VEK2818	REMOTE CONTROL JACK UNIT	1	
154(3)		VGQ0426	REMOTE CONTROL JACK MOUNT ANGLE	1	
155(3)		VJF0367	MODE SELECT KNOB ANGLE	1	
156(3)		VGU3045	MODE SELECT KNOB	2	
157(3)		VGU3050	VR KNOB	4	
159(3)		VGU3358	ROTARY KNOB	2	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
163(3)		VYK1480	BOTTOM CASE UNIT	1	
164(3)		VMZ0853	BOTTOM SHEET	1	
165(3)		VSC1811	BOTTOM SHIELD SHEET	1	
166(3)		VMP0940	BOTTOM CASE ANGLE	2	
167(3)		VKA0038	FOOT RUBBER	4	
168(3)		VKU0238	BOTTOM CASE	1	
169(3)		VSC1813	CYLINDER SHIELD PLATE	1	
170(3)		VWJ15A200MM	FLEXIBLE JAMPER	1	<R>
171(3)		VHD0309	SCREW	3	
172(3)		VGF0209	SWITCH COVER (A)	2	
173(3)		VGF0207	SWITCH COVER (B)	1	
174(3)		VSC1931	HEAD AMP SHIELD COVER	1	
175(3)		VSC1930	AUDIO SHIELD COVER	1	
176(3)		VSC2033	BIAS SHIELD COVER	1	
177(3)		VMG0312	RUBBER CAP	1	
178(3)		VHN0011	NYLON RIVET	5	
181(4)		VQT2079	OPERATING INSTRUCTIONS	1	AG-6400-E ONLY <!><R>
181(4)		VQT2080	OPERATING INSTRUCTIONS	1	<!> <R>
183(4)		VPN1533	CUSHION (R)	1	
184(4)		VPN1534	CUSHION (L)	1	
185(4)		VPG3074	PACKING CASE	1	FOR AG-6400-E <R>
185(4)		VPG3075	PACKING CASE	1	FOR AG-6400-B <R>
185(4)		VPG3076	PACKING CASE	1	FOR AG-6400-EN <R>
200(1)		VHD0081	SCREW	5	
201(1)		VHD0162	SCREW	1	
202(1)		VMP0987	CLAMP ANGLE	1	

3. ELECTRICAL REPLACEMENT PARTS LIST

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
		VEP01216B	A.V.R. & REEL SERVO C.B.A.	1	<R>
		VEP04177A	MAIN C.B.A.	1	<R>
		VEK3243	JACK PANEL UNIT	1	<R> PARTS LIST IS
					INCLUDED IN MAIN
					C.B.A.(VEP04177A)
		VEP03385A	VIDEO C.B.A.	1	<R>
		VEP06338B	FRONT C.B.A.	1	<R>
		VEP00B67A	FE HEAD C.B.A.	1	<R>
		VEK2821	REAR FRAME (R) UNIT	1	<R>
		VXA2554	A/C HEAD UNIT	1	<R>
		VXA2550	SOLENOID C.B. UNIT	1	<R>
		LN59	SENSOR LED	1	<R>
	■	VEP01216B	A.V.R. & REEL SERVO C.B.A.		
			CAPACITORS		
C1001		ECUX1H820KCN	CHIP 50V 82P	1	
C1002		ECUX1H561KBN	CHIP 50V 560P	1	
C1003		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C1004		ECEA1CK101I	ELECTROLYTIC 10V 100U	1	
C1005		ECUX1E473FN	CHIP 25V 0.047U	1	
C1006		ECUX1H103KBN	CHIP 50V 0.01U	1	
C1007		ECEA1CK101I	ELECTROLYTIC 10V 100U	1	
C1008		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C1010		ECEA1AK221Z	ELECTROLYTIC 10V 220U	1	
C1011		ECQV1H104JZ	MYLAR 50V 0.1U	1	
C1012		ECEA1CK101I	ELECTROLYTIC 10V 100U	1	
C1013		ECEA1CK101I	ELECTROLYTIC 10V 100U	1	
C1014		ECEA1CK101I	ELECTROLYTIC 10V 100U	1	
C1015		ECEA1CK101I	ELECTROLYTIC 10V 100U	1	
C1017		ECEA1AK221Z	ELECTROLYTIC 10V 220U	1	
C1018		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C1019		ECEA0JKS330I	ELECTROLYTIC 6.3V 33U	1	
C1020		ECEA1CK101I	ELECTROLYTIC 10V 100U	1	
C1021		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C1022		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C1023		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C1024		ECUX1H561KBN	CHIP 50V 560P	1	
C2201		ECUX1H220KCN	CHIP 50V 22P	1	
C2202		ECUX1H220KCN	CHIP 50V 22P	1	
C2203		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C2205		ECUX1E104ZFN	CHIP 25V 0.1U	1	
C2206		ECUX1E104ZFN	CHIP 25V 0.1U	1	
C2501		ECEA0JKN470	ELECTROLYTIC 6.3V 47U	1	
C2502		ECEA1HKNR22	ELECTROLYTIC 50V 0.22U	1	
C2503		ECEA1EKN3R3	ELECTROLYTIC 25V 3.3U	1	
C2504		ECEA1HKNR22	ELECTROLYTIC 50V 0.22U	1	
C2505		ECEA1EKS4R7I	ELECTROLYTIC 25V 4.7U	1	
C2506		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C2507		ECUX1H101KCN	CHIP 50V 100P	1	
C2508		ECUX1H472KBN	CHIP 50V 4700P	1	
C2509		ECQV1H473JZ	MYLAR 50V 0.047U	1	
C2510		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C2511		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C2512		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C2513		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C2514		ECUX1E473FN	CHIP 25V 0.047U	1	
C2515		ECUX1E473FN	CHIP 25V 0.047U	1	
C2516		ECUX1E473FN	CHIP 25V 0.047U	1	
C2517		ECEA1EKS4R7I	ELECTROLYTIC 25V 4.7U	1	
C2518		ECEA1EKS4R7I	ELECTROLYTIC 25V 4.7U	1	
C2519		ECEA1EKS4R7I	ELECTROLYTIC 25V 4.7U	1	
C2520		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C2521		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C2522		ECUX1E473FN	CHIP 25V 0.047U	1	
C2523		ECUX1E473FN	CHIP 25V 0.047U	1	
C2524		ECUX1E473FN	CHIP 25V 0.047U	1	
C2525		ECEA1EKS4R7I	ELECTROLYTIC 25V 4.7U	1	
C2526		ECEA1EKS4R7I	ELECTROLYTIC 25V 4.7U	1	
C2527		ECEA1EKS4R7I	ELECTROLYTIC 25V 4.7U	1	
C2528		ECEA1HKN010	ELECTROLYTIC 50V 1U	1	
C2529		ECEA1HKN010	ELECTROLYTIC 50V 1U	1	
D1001		MA151WK	DIODE	1	<R>
D1002		MA151WK	DIODE	1	<R>
D1003		ERA81004	DIODE	1	<R>
D2501		MA151A	DIODE	1	<R>
D2502		MA151A	DIODE	1	<R>
D2503		MA151A	DIODE	1	<R>
FS2501		VJS1413	CONNECTOR(FEMALE)	1	
FS2502		VJS1413	CONNECTOR(FEMALE)	1	
IC1001		BA6149LS	IC	1	<R>
IC1002		UN101	IC	1	<R>
IC2201		63B05U0A01F	IC	1	<R>
IC2202		MN4053BS	IC	1	<R>
IC2203		MN4013BS	IC	1	<R>
IC2501		AN3620SA	IC	1	<R>
IC2502		AN3830KA	IC	1	<R>
IC2503		AN3830K	IC	1	<R>
IC2504		AN6912S	IC	1	<R>
L1001		VLQ0128	COIL 47UH	1	
L1002		VLQ0129	COIL 300UH	1	
L1004		VLQ0129	COIL 300UH	1	
L1005		VLQ0129	COIL 300UH	1	
L1006		VLQ0129	COIL 300UH	1	
L1007		VLQ0129	COIL 300UH	1	
L1008		VLQ0128	COIL 47UH	1	
P1001		VJP1244T	CONNECTOR(MALE) 4P	1	
P1002		VJP1248T	CONNECTOR(MALE) 8P	1	
P2201		VJP1601T	CONNECTOR(MALE) 8P	1	
P2501		VJP1612T	CONNECTOR(MALE)	1	
P2502		VJP1243R	CONNECTOR(MALE) 3P	1	
PR1001		VSF0015A08	IC PROTECTOR	1	<!><R>
Q1001		2SD992	TRANSISTOR	1	(K,L,M)<R>
Q1002		2SA779KC	TRANSISTOR	1	<R>
Q2201		2SD1328	TRANSISTOR CHIP	1	<R>
Q2202		2SD1328	TRANSISTOR CHIP	1	<R>
Q2502		2SD602	TRANSISTOR CHIP	1	(Q,R,S)<R>
QR1001		UN2212	TRANSISTOR-RESISTOR	1	<R>
QR2201		UN2214	TRANSISTOR-RESISTOR	1	<R>
QR2501		UN2113	TRANSISTOR-RESISTOR	1	<R>
QR2502		UN2213	TRANSISTOR-RESISTOR	1	<R>
QR2503		UN2213	TRANSISTOR-RESISTOR	1	<R>
QR2504		UN2215	TRANSISTOR-RESISTOR	1	<R>

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
QR2505		UN2215	TRANSISTOR-RESISTOR	1	<R>
QR2506		UN2113	TRANSISTOR-RESISTOR	1	<R>
			RESISTORS		
R1001		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R1002		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R1003		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R1004		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R1005		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R1006		ERDS2TJ122	CARBON 1/4W 1.2K	1	
R1008		ERDS2TJ122	CARBON 1/4W 1.2K	1	
R1009		ERDS2TJ122	CARBON 1/4W 1.2K	1	
R1010		ERDS2TJ122	CARBON 1/4W 1.2K	1	
R1011		ERDS2TJ821	CARBON 1/4W 820	1	
R1012		ERDS2TJ122	CARBON 1/4W 1.2K	1	
R1013		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R1014		ERJ6GEYJ153	CHIP 1/16W 15K	1	
R1015		EVN32CA00B14	VARIABLE 10K	1	
R1016		ERJ6GEYJ153	CHIP 1/16W 15K	1	
R1019		ERDS2TJ221	CARBON 1/4W 220	1	
R1020		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R1021		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R1022		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R1023		ERDS2TJ103	CARBON 1/4W 10K	1	
R1024		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2203		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2204		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R2205		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R2206		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2207		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R2208		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R2209		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2210		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2211		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2212		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2213		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2214		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2215		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2216		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2217		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2218		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2219		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2220		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2221		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2222		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2223		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2224		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2225		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2226		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2227		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2228		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2229		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2230		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2231		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2232		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2233		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2234		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2235		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2236		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2237		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R2238		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R2239		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R2240		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R2241		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R2501		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R2502		ERJ6GEYJ153	CHIP 1/16W 15K	1	
R2503		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R2504		ERJ6GEYJ123	CHIP 1/16W 12K	1	
R2505		ERJ6GEYJ105	CHIP 1/16W 1M	1	
R2506		ERJ6GEYJ683	CHIP 1/16W 68K	1	
R2507		ERJ6GEYJ221	CHIP 1/16W 220	1	
R2508		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R2509		ERJ6GEYJ682	CHIP 1/16W 6.8K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R2510		ERJ6GEYJ334	CHIP 1/16W 330K	1	
R2511		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R2512		ERJ6GEYJ561	CHIP 1/16W 560	1	
R2514		ERJ6GEYJ182	CHIP 1/16W 1.8K	1	
R2515		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R2516		ERDS2TJ1R0	CARBON 1/4W 1.0	1	
R2517		ERDS2TJ120	CARBON 1/4W 12	1	
R2518		ERDS2TJR56	CARBON 1/4W 0.56	1	
R2519		ERDS2TJ120	CARBON 1/4W 12	1	
R2520		ERJ6GEYJ333	CHIP 1/16W 33K	1	
R2521		ERDS2TJ221	CARBON 1/4W 220	1	
R2522		ERDS2TJ820	CARBON 1/4W 82	1	
R2523		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R2524		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R2525		ERDS2TJ101	CARBON 1/4W 100	1	
R2526		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R2527		ERJ6GEYJ221	CHIP 1/16W 220	1	
R2528		ERJ6GEYJ153	CHIP 1/16W 15K	1	
R2529		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R2530		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R2531		ERJ6GEYJ821	CHIP 1/16W 820	1	
R2532		ERJ6GEYJ821	CHIP 1/16W 820	1	
R2533		ERJ6GEYJ183	CHIP 1/16W 180K	1	
R2534		ERJ6GEYJ182	CHIP 1/16W 1.8K	1	
X1001		VSX0136	CRYSTAL OSCILLATOR	1	<R>
X2201		VSX0180	CRYSTAL OSCILLATOR	1	<R>
	■	VEP04177A	MAIN C.B.A.		
			CAPACITORS		
C2001		ECEA1HKNR33	ELECTROLYTIC 50V 0.33U	1	
C2002		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C2003		ECEA1HKN010	ELECTROLYTIC 50V 1U	1	
C2004		ECUX1H330KCN	CHIP 50V 33P	1	
C2005		ECUX1H472KBN	CHIP 50V 4700P	1	
C2006		ECEA1HKN010	ELECTROLYTIC 50V 1U	1	
C2007		ECUX1H223ZFN	CHIP 50V 0.022U	1	
C2008		ECEA0GKS470I	ELECTROLYTIC 4V 47U	1	
C2009		ECEA0GKS101I	ELECTROLYTIC 4V 100U	1	
C2010		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C2011		ECUX1E473FN	CHIP 25V 0.047U	1	
C2012		ECQB1H273JH	MYLAR 50V 0.027U	1	
C2014		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C2015		ECEA0JKS101I	ELECTROLYTIC 6.3V 100U	1	
C2016		ECEA0JKS101I	ELECTROLYTIC 6.3V 100U	1	
C2017		ECQV1H473JZ	MYLAR 50V 0.047U	1	
C2018		ECKF1H103KB	CERAMIC 50V 0.01U	1	
C2019		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C2020		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C2021		ECQV1H473JZ	MYLAR 50V 0.047U	1	
C2022		ECKF1H472KB	CERAMIC 50V 4700P	1	
C2023		ECUX1H223ZFN	CHIP 50V 0.022U	1	
C2024		ECEA0JKS101I	ELECTROLYTIC 6.3V 100U	1	
C2025		ECSF1CE274	TANTALUM 16V 0.27U	1	
C2027		ECEA1HKSR47I	ELECTROLYTIC 50V 0.47U	1	
C2028		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C2029		ECEA1HKNR33	ELECTROLYTIC 50V 0.33U	1	
C2030		ECUX1H332KBN	CHIP 50V 3300P	1	
C2031		ECQV1H683JZ	MYLAR 50V 0.068U	1	
C2032		ECUX1H562KBN	CHIP 50V 5600P	1	
C2033		ECUX1H102KBN	CHIP 50V 1000P	1	
C2034		ECKF1H332KB	CERAMIC 50V 3300P	1	
C2035		ECKF1H682KB	MYLAR 50V 6800P	1	
C2036		ECKF1H562KB	CERAMIC 50V 5600P	1	
C2037		ECSF1CE474	TANTALUM 16V 0.47U	1	
C2038		ECUX1H103KBN	CHIP 50V 0.01U	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C2039		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C2040		ECUX1E3332FN	CHIP 25V 0.033U	1	
C2041		ECEA0GKS470I	ELECTROLYTIC 4V 47U	1	
C2042		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C2043		ECUX1E3332FN	CHIP 25V 0.033U	1	
C2044		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C2045		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C2046		ECQV1H224JZ	MYLAR 50V 0.22U	1	
C2047		ECQB1H103JH	MYLAR 50V 0.01U	1	
C2048		ECUX1H123KBN	CHIP 50V 0.012U	1	
C2049		ECQB1H123JH	MYLAR 50V 0.012U	1	
C2050		ECUX1H103KBN	CHIP 50V 0.01U	1	
C2051		ECUX1H103KBN	CHIP 50V 0.01U	1	
C2052		ECUX1H103KBN	CHIP 50V 0.01U	1	
C2053		ECEA1EKS3R3I	ELECTROLYTIC 25V 3.3U	1	
C2054		ECUX1H682KBN	CHIP 50V 6800P	1	
C2055		ECEA1HKSR22I	ELECTROLYTIC 50V 0.22U	1	
C2056		ECEA1CKS470I	ELECTROLYTIC 16V 47U	1	
C2058		ECEA1VKN2R2	ELECTROLYTIC 35V 2.2U	1	
C2059		ECEA1VKN2R2	ELECTROLYTIC 35V 2.2U	1	
C2060		ECEA1VKN2R2	ELECTROLYTIC 35V 2.2U	1	
C2061		ECQV1H104JZ	MYLAR 50V 0.1U	1	
C2062		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C2063		ECEA0GKS470I	ELECTROLYTIC 4V 47U	1	
C2064		ECEA1VKN2R2	ELECTROLYTIC 35V 2.2U	1	
C2065		ECEA1VKN2R2	ELECTROLYTIC 35V 2.2U	1	
C2066		ECEA1VKN2R2	ELECTROLYTIC 35V 2.2U	1	
C2067		ECEA1AKS470I	ELECTROLYTIC 10V 47U	1	
C2070		ECEA1HKN010	ELECTROLYTIC 50V 1U	1	
C2071		ECUX1H103KBN	CHIP 50V 0.01U	1	
C2072		ECEA1CKS470I	ELECTROLYTIC 16V 47U	1	
C2073		ECUX1H273KBN	CHIP 50V 0.027U	1	
C2074		ECQV1H104JZ	MYLAR 50V 0.1U	1	
C4001		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C4002		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4003		ECQB1H153JH	MYLAR 50V 0.015U	1	
C4004		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4005		ECEA1EKS4R7I	ELECTROLYTIC 25V 4.7U	1	
C4006		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C4007		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C4008		ECEA0JKS101I	ELECTROLYTIC 6.3V 100U	1	
C4009		ECSF1CE105	TANTALUM 16V 1U	1	
C4010		ECEA1AK101	ELECTROLYTIC 10V 100U	1	
C4011		ECSF1CE336	TANTALUM 16V 33U	1	
C4012		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C4013		ECUX1H391KBN	CHIP 50V 390P	1	
C4014		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C4015		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4016		ECQB1H153JH	MYLAR 50V 0.015U	1	
C4017		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4018		ECEA1EKS4R7I	ELECTROLYTIC 25V 4.7U	1	
C4019		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C4020		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C4021		ECEA0JKS101I	ELECTROLYTIC 6.3V 100U	1	
C4022		ECEA1AK101	ELECTROLYTIC 10V 100U	1	
C4023		ECSF1CE336	TANTALUM 16V 33U	1	
C4024		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C4025		ECUX1H391KBN	CHIP 50V 390P	1	
C4027		ECQB1H272JH	MYLAR 50V 2700P	1	
C4028		ECQB1H272JH	MYLAR 50V 2700P	1	
C4029		ECEA1AK221Z	ELECTROLYTIC 10V 220U	1	
C4030		ECSF1CE105	TANTALUM 16V 1U	1	
C4031		ECQB1H182JH	MYLAR 50V 1800P	1	
C4033		ECQB1H182JH	MYLAR 50V 1800P	1	
C4034		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4035		ECUX1H681KBN	CHIP 50V 680P	1	
C4036		ECUX1H681KBN	CHIP 50V 680P	1	
C4037		ECUX1H682KBN	CHIP 50V 6800P	1	
C4038		ECUX1H682KBN	CHIP 50V 6800P	1	
C4039		ECQM4152JZ	MYLAR 200V 1500P	1	
C4040		ECQV1H473JZ	MYLAR 50V 0.047U	1	
C4042		ECKD2H151KB	CERAMIC 500V 150P	1	
C4043		ECKD2H151KB	CERAMIC 500V 150P	1	
C4044		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4045		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C4046		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4047		ECUX1H102KBN	CHIP 50V 1000P	1	
C4048		ECEA1AKS330I	ELECTROLYTIC 10V 33U	1	
C4049		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4050		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4051		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4052		ECEA1AKS330I	ELECTROLYTIC 10V 33U	1	
C4053		ECUX1H102KBN	CHIP 50V 1000P	1	
C4054		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4055		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4056		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4057		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4058		ECEA1AKS470I	ELECTROLYTIC 10V 47U	1	
C4059		ECEA1AKS470I	ELECTROLYTIC 10V 47U	1	
C4060		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4061		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4062		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4063		ECEA1AKS470I	ELECTROLYTIC 10V 47U	1	
C4064		ECQV1H224JZ	MYLAR 50V 0.22U	1	
C4065		ECQV1H224JZ	MYLAR 50V 0.22U	1	
C4083		ECEA1AKS470I	ELECTROLYTIC 10V 47U	1	
C4084		ECEA1AKS470I	ELECTROLYTIC 10V 47U	1	
C4100		ECEA1AK101	ELECTROLYTIC 10V 100U	1	
C4103		ECEA1AKS330I	ELECTROLYTIC 10V 33U	1	
C4104		ECEA0JKS101I	ELECTROLYTIC 6.3V 100U	1	
C4105		ECEA1AKN330	ELECTROLYTIC 10V 33U	1	
C4108		ECEA1AKN330	ELECTROLYTIC 10V 33U	1	
C4401		ECEA1CK101I	ELECTROLYTIC 10V 100U	1	
C4402		ECEA1AK221Z	ELECTROLYTIC 10V 220U	1	
C4403		ECQB1H472JH	MYLAR 50V 4700P	1	
C4404		ECQB1H472JH	MYLAR 50V 4700P	1	
C4405		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4406		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4407		ECEA1CKS470I	ELECTROLYTIC 16V 47U	1	
C4408		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4501		ECEA1CK101I	ELECTROLYTIC 10V 100U	1	
C4502		ECEA1AK221Z	ELECTROLYTIC 10V 220U	1	
C4503		ECUX1H681KBN	CHIP 50V 680P	1	
C4504		ECEA1HKS2R2I	ELECTROLYTIC 50V 2.2U	1	
C4505		ECEA1CKS470I	ELECTROLYTIC 16V 47U	1	
C4506		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4507		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C4508		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4509		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C4510		ECEA1AK221Z	ELECTROLYTIC 10V 220U	1	
C4511		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4512		ECQB1H103JH	MYLAR 50V 0.01U	1	
C4513		ECEA25Z3R3	ELECTROLYTIC 25V 3.3U	1	
C4514		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4517		ECEA0JKS101I	ELECTROLYTIC 6.3V 100U	1	
C4520		ECEA1EKS3R3I	ELECTROLYTIC 25V 3.3U	1	
C4521		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4522		ECUX1H220KCN	CHIP 50V 22P	1	
C4523		ECUX1H680KCN	CHIP 50V 68P	1	
C4524		ECEA25Z3R3	ELECTROLYTIC 25V 3.3U	1	
C4525		ECQV1H473JZ	MYLAR 50V 0.047U	1	
C4526		ECEA1HKS0R1	ELECTROLYTIC 50V 0.1U	1	
C4527		ECEA1EFS220	ELECTROLYTIC 25V 22U	1	
C4528		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C4529		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C4530		ECQV1H393JZ	MYLAR 50V 0.039U	1	
C4531		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C4532		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C4533		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4534		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C4535		ECUX1H561KBN	CHIP 50V 560P	1	
C4536		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C4537		ECUX1H331KBN	CHIP 50V 330P	1	
C4539		ECEA0JKS101I	ELECTROLYTIC 6.3V 100U	1	
C4540		ECUX1H151KCN	CHIP 50V 150P	1	
C4541		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4542		ECEA1CKS470I	ELECTROLYTIC 16V 47U	1	
C4543		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4544		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C4545		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C4546		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C4547		ECEA1AK221Z	ELECTROLYTIC 10V 220U	1	
C4548		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4549		ECEA25Z3R3	ELECTROLYTIC 25V 3.3U	1	
C4550		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4553		ECEA0JKS101I	ELECTROLYTIC 6.3V 100U	1	
C4554		ECEA1EKS3R3I	ELECTROLYTIC 25V 3.3U	1	
C4555		ECEA1EKS3R3I	ELECTROLYTIC 25V 3.3U	1	
C4556		ECEA1EKS3R3I	ELECTROLYTIC 25V 3.3U	1	
C4557		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4558		ECUX1H470KCN	CHIP 50V 47P	1	
C4559		ECEA25Z3R3	ELECTROLYTIC 25V 3.3U	1	
C4560		ECQV1H473JZ	MYLAR 50V 0.047U	1	
C4562		ECEA1EFS220	ELECTROLYTIC 25V 22U	1	
C4563		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C4564		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C4565		ECQV1H393JZ	MYLAR 50V 0.039U	1	
C4566		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C4567		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C4568		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4569		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C4570		ECUX1H561KBN	CHIP 50V 560P	1	
C4571		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C4572		ECUX1H331KBN	CHIP 50V 330P	1	
C4574		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C4575		ECQB1H562JH	MYLAR 50V 5600P	1	
C4576		ECQB1H562JH	MYLAR 50V 5600P	1	
C4577		ECQB1H103JH	MYLAR 50V 0.01U	1	
C4578		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4580		ECUX1H153KBN	CHIP 50V 0.015U	1	
C4581		ECUX1H153KBN	CHIP 50V 0.015U	1	
C4582		ECQV1H154JZ	MYLAR 50V 0.15U	1	
C4583		ECUX1H221KBN	CHIP 50V 220P	1	
C4584		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4585		ECUX1H151KCN	CHIP 50V 150P	1	
C4586		ECUX1H151KCN	CHIP 50V 150P	1	
C4587		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4588		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4589		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4590		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4591		ECEA1CKS330I	ELECTROLYTIC 16V 33U	1	
C4592		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4593		ECSF1VE104	TANTALUM 35V 0.1U	1	
C4594		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4596		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C4597		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4598		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4599		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C4601		ECEA0JKS330I	ELECTROLYTIC 6.3V 33U	1	
C4602		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4603		ECUX1H560KCN	CHIP 50V 56P	1	
C4604		ECUX1H560KCN	CHIP 50V 56P	1	
C4606		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4607		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4608		ECUX1H050DCN	CHIP 50V 50P	1	
C4609		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C4610		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4611		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4612		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4613		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4614		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4615		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4616		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4618		ECUX1H103KBN	CHIP 50V 0.01U	1	
C4619		ECEA1AKS330I	ELECTROLYTIC 10V 33U	1	
C4620		ECEA1AFS101	ELECTROLYTIC 10V 100U	1	
C4621		ECEA1AFS101	ELECTROLYTIC 10V 100U	1	
C4622		ECCF1H221JC	CERAMIC 50V 220P	1	
C4623		ECUX1H102KBN	CHIP 50V 1000P	1	
C4624		ECCF1H221JC	CERAMIC 50V 220P	1	
C4625		ECEA1AKS220I	ELECTROLYTIC 10V 22U	1	
C4626		ECUX1H100DCN	CHIP 50V 10P	1	
C4627		ECUX1H100DCN	CHIP 50V 10P	1	
C4628		ECEA1AKS470I	ELECTROLYTIC 10V 47U	1	
C4629		ECEA0JKS101I	ELECTROLYTIC 6.3V 100U	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C4630		ECEA0JKS101I	ELECTROLYTIC 6.3V 100U	1	
C4631		ECUX1H102KBN	CHIP 50V 1000P	1	
C6001		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C6002		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C6003		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C6004		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C6005		ECUX1H103KBN	CHIP 50V 0.01U	1	
C6006		ECEA0JKS101I	ELECTROLYTIC 6.3V 100U	1	
C6007		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C6008		ECUX1H103KBN	CHIP 50V 0.01U	1	
C6009		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C6010		ECUX1H103KBN	CHIP 50V 0.01U	1	
C6011		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C6012		ECEA1CKS330I	ELECTROLYTIC 16V 33U	1	
C6013		ECUX1H103KBN	CHIP 50V 0.01U	1	
C6014		ECEA1CSS102	ELECTROLYTIC 16V 1000U	1	
C6015		ECUX1H103KBN	CHIP 50V 0.01U	1	
C6016		ECUX1H103KBN	CHIP 50V 0.01U	1	
C6017		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C6018		ECEA0GKS470I	ELECTROLYTIC 4V 47U	1	
C6019		ECEA1EKS100I	ELECTROLYTIC 25V 10U	1	
C6020		ECEA1HKS0R1	ELECTROLYTIC 50V 0.1U	1	
C6021		ECEA1HKS0R1	ELECTROLYTIC 50V 0.1U	1	
C6022		ECUX1H330KCN	CHIP 50V 33P	1	
C6023		ECUX1H100DCN	CHIP 50V 10P	1	
C6024		ECUX1H103KBN	CHIP 50V 0.01U	1	
C6025		ECUX1H103KBN	CHIP 50V 0.01U	1	
C6026		ECQV1H104JZ	MYLAR 50V 0.1U	1	
C6601		ECEA1AKS330I	ELECTROLYTIC 10V 33U	1	
C6602		ECEA1AKS470I	ELECTROLYTIC 10V 47U	1	
C6603		ECEA1CKN100	ELECTROLYTIC 16V 10U	1	
C6604		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C6605		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C6606		ECEA1EKS4R7I	ELECTROLYTIC 25V 4.7U	1	
C6607		ECEA1AKS470I	ELECTROLYTIC 10V 47U	1	
C6608		ECEA1CKN100	ELECTROLYTIC 16V 10U	1	
C6609		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C6610		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C6611		ECEA1EKS4R7I	ELECTROLYTIC 25V 4.7U	1	
C6612		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C6613		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C6614		ECEA1CK101I	ELECTROLYTIC 10V 100U	1	
C6615		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C6616		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C6618		ECQV1H224JZ	MYLAR 50V 0.22U	1	
C6619		ECEA1HK3R3	ELECTROLYTIC 50V 3.3U	1	
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D6005		MA151A	DIODE	1	<R>

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
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D6608		MA151K	DIODE	1	<R>
F6001		XBA2C50TB0	FUSE	1	<!><R>
F6002		XBA2C10TB0	FUSE	1	<!><R>
F6003		XBA2C16TB0	FUSE	1	<!><R>
FL4401		VLF0402	FILTER	1	
FL4402		VLF0402	FILTER	1	
FL4501		VLF0444	FILTER	1	
FL4502		VLF0446	FILTER	1	
FS2001		VJS1900	CONNECTOR(FEMALE)	1	
FS2002		VJS1412	CONNECTOR(FEMALE)	1	
IC2001		VCR0094	IC	1	<R>
IC2002		AN3615K	IC	1	<R>
IC2003		UPC1516CA	IC	1	<R>
IC2004		AN3715S	IC	1	<R>
IC2005		AN3810K	IC	1	<R>
IC2006		AN3821K	IC	1	<R>
IC4001		VEFA005	FIC	1	<R>
IC4002		VEFA005	FIC	1	<R>
IC4006		TA7325P	IC	1	<R>
IC4007		AN6558	IC	1	<R>
IC4101		UPC393C	IC	1	<R>
IC4401		NR8830	IC	1	<R>
IC4402		UPD4066BG	IC	1	<R>
IC4501		VEFA007	FIC	1	<R>
IC4503		VCR0112	IC	1	<R>
IC4504		VEFA007	FIC	1	<R>
IC4506		VCR0112	IC	1	<R>
IC4507		UPC1531HA	IC	1	<R>
IC4508		AN3920K	IC	1	<R>
IC4509		AN6558S	IC	1	<R>
IC6001		MN1534VGA	IC	1	<R>
IC6002		BA6209U3	IC	1	<R>
IC6003		VCR0091	IC	1	<R>
IC6005		AN78L05	IC	1	<R>
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IC6601		VCR0114	IC	1	<R>
IC6602		BA7001	IC	1	<R>
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IC6604		MN4013BS	IC	1	<R>
IC6605		MN4538BS	IC	1	<R>
L2001		VLQEL05F820K	COIL 82UH	1	
L2002		VLQEL05F101K	COIL 100UH	1	
L4001		VLQEL05F820K	COIL 82UH	1	
L4002		ELTMR153KB	TRANSFORMER	1	
L4003		VLQ0212	COIL 47uH	1	
L4004		ELTMR153KB	TRANSFORMER	1	
L4005		VTQ0016	COIL	1	
L4006		VTQ0016	COIL	1	
L4010		VLQEL05F221K	COIL 220UH	1	
L4501		VLQEL05F121K	COIL 120UH	1	
L4502		VLQEL05F101K	COIL 100UH	1	
L4503		VLQ0172	COIL	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
L4504		VLQ0172	COIL	1	
L4505		VLQEL05F101K	COIL 100UH	1	
L4506		VLQEL05F101K	COIL 100UH	1	
L4508		VLQEL06F821K	COIL 820uH	1	
L4509		VLQEL05F101K	COIL 100UH	1	
L4510		VLQEL05F821K	COIL 820uH	1	
L4511		VLP0017	COIL	1	
L4512		VLP0017	COIL	1	
L4513		VLQ0123	COIL	1	
L4514		VLQ0123	COIL	1	
L4515		VLQEL05F101K	COIL 100UH	1	
L4516		VLQEL05F101K	COIL 100UH	1	
L4517		VLQEL05F101K	COIL 100UH	1	
P2001		VJP1229T	CONNECTOR(MALE) 2P	1	
P2002		VJP1596T	CONNECTOR(MALE) 3P	1	
P2003		VJS1409	CONNECTOR(FEMALE)	1	
P2004		VJP1231T	CONNECTOR(MALE) 4P	1	
P2005		VJP1235T	CONNECTOR(MALE) 8P	1	
P2006		VJP1601T	CONNECTOR(MALE) 8P	1	
P4001		VJP1231R	CONNECTOR(MALE) 4P	1	
P4002		VJP1231T	CONNECTOR(MALE) 4P	1	
P4003		VJP1605T	CONNECTOR(MALE) 12P	1	
P4004		VJP1595T	CONNECTOR(MALE) 2P	1	
P4402		VJP1597T	CONNECTOR(MALE) 4P	1	
P4501		VJP1597T	CONNECTOR(MALE) 4P	1	
P4502		VJP1231T	CONNECTOR(MALE) 4P	1	
P6001		VJP1601T	CONNECTOR(MALE) 8P	1	
P6002		VJP1595T	CONNECTOR(MALE) 2P	1	
P6003		VJP1231R	CONNECTOR(MALE) 4P	1	
P6004		VJP1229	CONNECTOR(MALE) 2P	1	
P6005		VJP1229T	CONNECTOR(MALE) 2P	1	
P6006		VJP1151	CONNECTOR(MALE)	1	
P6007		VJP1231T	CONNECTOR(MALE) 4P	1	
P6008		VJP1231B	CONNECTOR(MALE) 4P	1	
P6009		VJP1229	CONNECTOR(MALE) 2P	1	
P6010		VJP1603T	CONNECTOR(MALE) 10P	1	
P6011		VJP1229	CONNECTOR(MALE) 2P	1	
P6012		VJP1229	CONNECTOR(MALE) 2P	1	
P6013		VJP1230T	CONNECTOR(MALE) 3P	1	
P6601		VJP1237T	CONNECTOR(MALE) 10P	1	
P6603		VJS1409	CONNECTOR(FEMALE)	1	
P6604		VJP1229T	CONNECTOR(MALE) 2P	1	
P6606		VJP1230T	CONNECTOR(MALE) 3P	1	
Q2001		2SB709	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q2003		2SB709	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q2004		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q2005		2SD1328	TRANSISTOR CHIP	1	(R,S)<R>
Q4001		2SD973A	TRANSISTOR	1	(R)<R>
Q4002		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q4008		2SD1328	TRANSISTOR CHIP	1	(R,S)<R>
Q4009		2SD639	TRANSISTOR	1	(Q,R,S)<R>
Q4401		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q4402		2SD1328	TRANSISTOR CHIP	1	(R,S,T,X)<R>
Q4403		2SD1328	TRANSISTOR CHIP	1	(R,S,T,X)<R>
Q4404		2SD1328	TRANSISTOR CHIP	1	(R,S)<R>
Q4501		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q4502		2SD638	TRANSISTOR	1	(Q,R,S)<R>
Q4507		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q4513		2SC2404	TRANSISTOR CHIP	1	(C,D)<R>
Q4514		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q4515		2SB709	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q4516		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q4517		2SD1328	TRANSISTOR CHIP	1	(R,S)<R>
Q4518		2SD1328	TRANSISTOR CHIP	1	(R,S)<R>
Q4519		2SD1328	TRANSISTOR CHIP	1	(R,S)<R>
Q4520		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q4521		2SB709	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q4522		2SC2404	TRANSISTOR CHIP	1	(C,D)<R>
Q6001		2SB643	TRANSISTOR	1	(Q,R,S)<R>

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
Q6002		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q6005		2SB774	TRANSISTOR	1	(Q,R,S)<R>
Q6006		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q6007		2SB819	TRANSISTOR	1	(Q,R,S)<R>
Q6008		2SD973	TRANSISTOR	1	(Q,R,S)<R>
Q6009		2SB933	TRANSISTOR	1	(Q)<R>
Q6010		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q6011		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q6012		2SD638	TRANSISTOR	1	(Q,R,S)<R>
Q6013		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q6014		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q6015		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q6016		2SB709	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q6601		2SB709	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q6602		2SB709	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q6603		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
QR2001		UN2110	TRANSISTOR-RESISTOR	1	<R>
QR2002		UN2213	TRANSISTOR-RESISTOR	1	<R>
QR2003		UN2212	TRANSISTOR-RESISTOR	1	<R>
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QR4001		UN2212	TRANSISTOR-RESISTOR	1	<R>
QR4002		UN2211	TRANSISTOR-RESISTOR	1	<R>
QR4003		UN2212	TRANSISTOR-RESISTOR	1	<R>
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QR4101		UN2111	TRANSISTOR-RESISTOR	1	<R>
QR4102		UN2115	TRANSISTOR-RESISTOR	1	<R>
QR4103		UN2116	TRANSISTOR-RESISTOR	1	<R>
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QR4105		UN2215	TRANSISTOR-RESISTOR	1	<R>
QR4401		UN2213	TRANSISTOR-RESISTOR	1	<R>
QR4402		UN2213	TRANSISTOR-RESISTOR	1	<R>
QR4403		UN2213	TRANSISTOR-RESISTOR	1	<R>
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QR4502		UN2212	TRANSISTOR-RESISTOR	1	<R>
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QR6607		UN2215	TRANSISTOR-RESISTOR	1	<R>
QR6608		UN2215	TRANSISTOR-RESISTOR	1	<R>
QR6609		UN2212	TRANSISTOR-RESISTOR	1	<R>
			RESISTORS		
R2001		ERJ6GEYJ182	CHIP 1/16W 1.8K	1	
R2002		ERJ6GEYJ562	CHIP 1/16W 5.6K	1	
R2003		ERJ6GEYJ821	CHIP 1/16W 820	1	
R2004		ERJ6GEYJ273	CHIP 1/16W 27K	1	
R2005		EVMLGGA00B15	VARIABLE 100K	1	
R2007		ERJ6GEYJ153	CHIP 1/16W 15K	1	
R2008		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R2009		ERDS2TJ560	CARBON 1/4W 56	1	
R2010		ERDS2TJ560	CARBON 1/4W 56	1	
R2011		ERJ6GEYJ272	CHIP 1/16W 2.7K	1	
R2012		ERJ6GEYJ333	CHIP 1/16W 33K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R2013		ERJ6GEYJ124	CHIP 1/16W 120K	1	
R2014		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R2015		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R2016		ERJ6GEYJ334	CHIP 1/16W 330K	1	
R2017		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R2018		ERJ6GEYJ123	CHIP 1/16W 12K	1	
R2019		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R2020		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R2021		EVMLGGA00B15	VARIABLE 100K	1	
R2022		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R2023		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R2024		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R2025		ERJ6GEYG223	CHIP 1/16W 22K	1	
R2026		ERJ6GEYG223	CHIP 1/16W 22K	1	
R2027		ERJ6GEYJ273	CHIP 1/16W 27K	1	
R2028		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R2029		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R2030		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R2031		ERJ6GEYJ224	CHIP 1/16W 220K	1	
R2034		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R2035		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R2036		ERJ6GEYJ564	CHIP 1/16W 560K	1	
R2040		ERJ6GEYJ273	CHIP 1/16W 27K	1	
R2042		ERJ6GEYJ153	CHIP 1/16W 15K	1	
R2043		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R2045		ERJ6GEYJ823	CHIP 1/16W 82K	1	
R2046		ERJ6GEYJ823	CHIP 1/16W 82K	1	
R2047		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R2048		EVMLGGA00B15	VARIABLE 100K	1	
R2049		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R2050		ERJ6GEYJ334	CHIP 1/16W 390K	1	
R2051		ERJ6GEYJ271	CHIP 1/16W 270	1	
R2052		ERJ6GEYJ394	CHIP 1/16W 390K	1	
R2053		ERJ6GEYJ683	CHIP 1/16W 68K	1	
R2054		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R2056		ERDS2TJ1R0	CARBON 1/4W 1	1	
R2057		ERJ6GEYJ333	CHIP 1/16W 33K	1	
R2058		ERJ6GEYJ183	CHIP 1/16W 180K	1	
R2059		ERJ6GEYJ124	CHIP 1/16W 120K	1	
R2060		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R2061		ERJ6GEYK6R8	CHIP 1/10W 6.8	1	
R2062		ERJ6GEYK6R8	CHIP 1/10W 6.8	1	
R2063		ERJ6GEYK6R8	CHIP 1/10W 6.8	1	
R2064		ERDS2TJR68	CARBON 1/4W 0.68	1	
R2065		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R2066		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R2067		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R2068		EVMLGGA00B23	VARIABLE 2K	1	
R2069		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R2070		ERJ6GEYJ224	CHIP 1/16W 220K	1	
R2071		ERJ6GEYJ224	CHIP 1/16W 220K	1	
R2072		ERJ6GEYJ224	CHIP 1/16W 220K	1	
R2073		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R2074		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R2075		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R2076		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R2077		ERJ6GEYJ474	CHIP 1/16W 470K	1	
R2078		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2079		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R2080		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R2081		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R2082		ERJ6GEYG824	CHIP 1/10W 820K	1	
R2083		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R2084		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R2085		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R2087		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R2088		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R2089		ERJ6GEY0R00	CHIP 1/16W 0	1	
R4001		ERJ6GEYJ123	CHIP 1/16W 12K	1	
R4002		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R4003		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R4004		ERJ6GEYJ123	CHIP 1/16W 12K	1	
R4005		ERJ6GEYJ105	CHIP 1/16W 1M	1	
R4006		ERJ6GEYJ333	CHIP 1/16W 33K	1	
R4007		ERJ6GEYJ123	CHIP 1/16W 12K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R4008		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4010		ERJ6GEYJ123	CHIP 1/16W 12K	1	
R4011		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R4012		ERJ6GEYJ562	CHIP 1/16W 5.6K	1	
R4014		ERJ6GEYJ123	CHIP 1/16W 12K	1	
R4015		ERJ6GEYJ105	CHIP 1/16W 1M	1	
R4016		ERJ6GEYJ333	CHIP 1/16W 33K	1	
R4017		ERJ6GEYJ562	CHIP 1/16W 5.6K	1	
R4018		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4020		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R4021		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R4022		ERJ6GEYJ562	CHIP 1/16W 5.6K	1	
R4023		ERJ6GEYJ221	CHIP 1/16W 220	1	
R4024		ERJ6GEYJ221	CHIP 1/16W 220	1	
R4025		ERJ6GEYJ562	CHIP 1/16W 5.6K	1	
R4026		ERJ6GEYJ101	CHIP 1/16W 100	1	
R4027		ERJ6GEYJ101	CHIP 1/16W 100	1	
R4032		ERJ6GEYJ822	CHIP 1/16W 8.2K	1	
R4033		ERDS2TJ3R3	CARBON 1/4W 3.3	1	
R4040		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R4041		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R4042		ERJ6GEYJ274	CHIP 1/16W 270K	1	
R4043		ERJ6GEYJ333	CHIP 1/16W 33K	1	
R4044		ERJ6GEYJ471	CHIP 1/16W 470	1	
R4045		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R4046		ERJ6GEYJ274	CHIP 1/16W 270K	1	
R4047		ERJ6GEYJ333	CHIP 1/16W 33K	1	
R4048		ERJ6GEYJ471	CHIP 1/16W 470	1	
R4049		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R4050		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R4051		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R4052		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R4053		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R4054		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R4055		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4056		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4061		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R4062		ERJ6GEYJ683	CHIP 1/16W 68K	1	
R4063		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R4064		ERJ6GEYJ683	CHIP 1/16W 68K	1	
R4065		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4067		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R4069		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R4070		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4079		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R4080		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R4081		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R4084		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R4102		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R4103		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R4138		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R4142		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R4143		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R4144		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4146		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4147		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4148		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R4149		ERJ6GEYJ564	CHIP 1/16W 560K	1	
R4153		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4154		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R4165		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R4166		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R4401		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R4402		ERJ6GEYJ392	CHIP 1/16W 3.9K	1	
R4403		ERJ6GEYJ391	CHIP 1/16W 390	1	
R4404		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R4405		ERJ6GEYJ392	CHIP 1/16W 3.9K	1	
R4406		ERJ6GEYJ391	CHIP 1/16W 390	1	
R4407		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R4408		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R4409		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R4410		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R4414		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R4415		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R4418		ERJ6GEYJ103	CHIP 1/16W 10K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R4419		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4420		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R4421		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R4422		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4423		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4501		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R4502		ERJ6GEYJ821	CHIP 1/16W 820	1	
R4503		ERJ6GEYG132	CHIP 1/10W 1.3K	1	
R4504		ERJ6GEYJ242	CHIP 1/16W 2.4K	1	
R4505		ERJ6GEYG132	CHIP 1/10W 1.3K	1	
R4506		ERJ6GEYG471	CHIP 1/10W 470	1	
R4507		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R4508		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R4509		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R4510		ERJ6GEYG102	CHIP 1/16W 1K	1	
R4511		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R4512		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R4513		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R4514		ERJ6GEYJ821	CHIP 1/16W 820	1	
R4515		ERJ6GEYJ271	CHIP 1/16W 270	1	
R4516		ERJ6GEYJ123	CHIP 1/16W 12K	1	
R4517		ERJ6GEYG472	CHIP 1/16W 4.7K	1	
R4518		ERJ6GEYG471	CHIP 1/10W 470	1	
R4519		ERJ6GEYJ101	CHIP 1/16W 100	1	
R4520		ERJ6GEYJ123	CHIP 1/16W 12K	1	
R4521		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R4522		ERJ6GEYJ183	CHIP 1/16W 180K	1	
R4523		ERJ6GEYJ682	CHIP 1/16W 6.8K	1	
R4524		ERJ6GEYJ273	CHIP 1/16W 27K	1	
R4525		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R4526		ERJ6GEYG471	CHIP 1/10W 470	1	
R4529		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R4530		ERJ6GEYG102	CHIP 1/16W 1K	1	
R4532		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R4533		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R4534		ERJ6GEYJ272	CHIP 1/16W 2.7K	1	
R4537		ERJ6GEYJ101	CHIP 1/16W 100	1	
R4538		ERJ6GEYG472	CHIP 1/16W 4.7K	1	
R4539		ERJ6GEYG471	CHIP 1/10W 470	1	
R4541		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R4542		ERJ6GEYJ183	CHIP 1/16W 180K	1	
R4543		ERJ6GEYJ682	CHIP 1/16W 6.8K	1	
R4544		ERJ6GEYJ181	CHIP 1/16W 180	1	
R4545		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R4546		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R4547		ERJ6GEYJ272	CHIP 1/16W 2.7K	1	
R4548		ERJ6GEYJ183	CHIP 1/16W 180K	1	
R4549		ERJ6GEYJ562	CHIP 1/16W 5.6K	1	
R4550		ERJ6GEYJ242	CHIP 1/16W 2.4K	1	
R4551		ERJ6GEYJ154	CHIP 1/16W 150K	1	
R4553		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R4554		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R4555		ERJ6GEYJ272	CHIP 1/16W 2.7K	1	
R4556		ERJ6GEYJ101	CHIP 1/16W 100	1	
R4557		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R4558		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R4559		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R4560		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R4561		ERJ6GEYJ392	CHIP 1/16W 3.9K	1	
R4562		ERJ6GEYJ392	CHIP 1/16W 3.9K	1	
R4563		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R4564		ERJ6GEYJ3R3	CHIP 1/10W 3.3	1	
R4565		ERJ6GEYJ3R3	CHIP 1/10W 3.3	1	
R4566		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R4567		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R4568		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R4569		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R4570		ERJ6GEYJ100	CHIP 1/16W 10	1	
R4571		ERJ6GEYJ100	CHIP 1/16W 10	1	
R4572		ERJ6GEYJ682	CHIP 1/16W 6.8K	1	
R4573		ERJ6GEYJ821	CHIP 1/16W 820	1	
R4574		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R4575		ERJ6GEYJ393	CHIP 1/16W 39K	1	
R4576		ERJ6GEYJ393	CHIP 1/16W 39K	1	
R4577		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R4578		ERJ6GEYJ821	CHIP 1/16W 820	1	
R4579		ERJ6GEYJ561	CHIP 1/16W 560	1	
R4580		ERJ6GEYJ561	CHIP 1/16W 560	1	
R4581		ERJ6GEYJ182	CHIP 1/16W 1.8K	1	
R4582		ERJ6GEYJ182	CHIP 1/16W 1.8K	1	
R4583		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R4584		ERJ6GEYJ100	CHIP 1/16W 10	1	
R4585		ERJ6GEYJ182	CHIP 1/16W 1.8K	1	
R4586		ERJ6GEYJ182	CHIP 1/16W 1.8K	1	
R4587		ERJ6GEYJ330	CHIP 1/16W 33	1	
R4588		ERJ6GEYJ330	CHIP 1/16W 33	1	
R4751		ERDS2TJ561	CARBON 1/4W 560	1	
R4752		ERDS2TJ561	CARBON 1/4W 560	1	
R6001		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6002		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6003		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6004		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6005		ERDS2TJ270	CARBON 1/4W 27	1	
R6006		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R6007		ERJ6GEYJ683	CHIP 1/16W 68K	1	
R6008		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6009		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R6010		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R6011		ERJ6GEYJ184	CHIP 1/10W 180K	1	
R6012		ERJ6GEYJ124	CHIP 1/16W 120K	1	
R6013		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R6014		ERJ6GEYJ101	CHIP 1/16W 100	1	
R6015		ERJ6GEYJ333	CHIP 1/16W 33K	1	
R6016		ERJ6GEYJ183	CHIP 1/16W 180K	1	
R6017		ERJ6GEYJ562	CHIP 1/16W 5.6K	1	
R6018		ERJ6GEYJ153	CHIP 1/16W 15K	1	
R6019		ERJ6GEYJ153	CHIP 1/16W 15K	1	
R6021		ERDS2TJ223	CARBON 1/4W 22K	1	
R6022		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6023		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R6024		ERDS2TJ473	CARBON 1/4W 47K	1	
R6027		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R6028		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6029		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6030		ERJ6GEYJ562	CHIP 1/16W 5.6K	1	
R6031		ERJ6GEYJ682	CHIP 1/16W 6.8K	1	
R6032		ERD25TJ682	CARBON 1/4W 6.8K	1	
R6033		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R6034		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6035		ERDS2TJ221	CARBON 1/4W 220	1	
R6036		ERD25TJ104	CARBON 1/4W 100K	1	
R6037		ERD25TJ473	CARBON 1/4W 47K	1	
R6038		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R6039		ERJ6GEYJ123	CHIP 1/16W 12K	1	
R6040		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R6041		ERG1ANJ820	METAL OXIDE 1W 82	1	
R6042		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R6043		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R6044		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6045		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6046		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6047		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6048		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6050		ERJ6GEYJ562	CHIP 1/16W 5.6K	1	
R6051		ERDS2TJ332	CARBON 1/4W 3.3K	1	
R6052		ERD2FCJ4R7	CARBON 2W 4.7	1	<!><R>
R6053		ERD25TJ223	CARBON 1/4W 22K	1	
R6054		ERD25TJ102	CARBON 1/4W 1K	1	
R6055		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R6057		ERD25TJ221	CARBON 1/4W 220	1	
R6058		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R6059		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R6060		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6061		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R6062		ERJ6GEYJ184	CHIP 1/10W 180K	1	
R6063		ERJ6GEYJ474	CHIP 1/16W 470K	1	
R6064		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R6065		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R6066		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R6067		ERJ6GEYJ473	CHIP 1/16W 47K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R6068		ERJ6GEYJ271	CHIP 1/16W 270	1	
R6069		ERJ6GEYJ101	CHIP 1/16W 100	1	
R6070		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6071		ERJ6GEYJ105	CHIP 1/16W 1M	1	
R6072		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R6073		ERJ6GEYJ333	CHIP 1/16W 33K	1	
R6074		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R6075		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R6076		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R6077		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R6078		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R6079		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R6080		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R6081		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R6082		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R6083		ERJ6GEYJ474	CHIP 1/16W 470K	1	
R6601		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R6602		ERJ6GEYJ183	CHIP 1/16W 180K	1	
R6603		ERJ6GEYJ681	CHIP 1/16W 680	1	
R6604		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6605		ERJ6GEYJ823	CHIP 1/16W 82K	1	
R6606		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R6607		ERJ6GEYJ224	CHIP 1/16W 220K	1	
R6608		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R6609		ERDS2TJ750	CARBON 1/4W 75	1	
R6610		ERJ6GEYJ681	CHIP 1/16W 680	1	
R6611		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6612		ERJ6GEYJ823	CHIP 1/16W 82K	1	
R6613		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R6614		ERJ6GEYJ224	CHIP 1/16W 220K	1	
R6615		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R6616		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R6617		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R6618		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6619		EVMLGGA00B15	VARIABLE 100K	1	
R6620		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6621		ERJ6GEYJ333	CHIP 1/16W 33K	1	
R6622		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R6623		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6624		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R6625		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R6626		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R6627		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R6628		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R6629		ERDS2TJ330	CARBON 1/4W 33	1	
R6630		ERJ6GEYJ750	CHIP 1/16W 75	1	
R6631		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6632		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R6633		ERJ6GEYJ562	CHIP 1/16W 5.6K	1	
R6634		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6635		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6636		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6637		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R6638		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R6639		ERJ6GEYJ103	CHIP 1/16W 10K	1	
RY4001		VSY2036	RELAY	1	
RY4002		VSY2036	RELAY	1	
SW4001		VSR0036	SWITCH	1	<R>
SW4002		VSR0036	SWITCH	1	<R>
SW4003		VSS0127	SWITCH	1	<R>
SW6601		VSS0154	SWITCH	1	<R>
SW6602		VSS0154	SWITCH	1	<R>
SW6603		VSS0126	SWITCH	1	<R>
SW6604		VSS0154	SWITCH	1	<R>
T4001		VLT0287	TRANSFORMER	1	
VR4001		EVMLGGA00B23	VARIABLE 2K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
VR4002		EVMLGGA00B23	VARIABLE 2K	1	
VR4003		EVMLGGA00B25	VARIABLE 200K	1	
VR4004		EVMLGGA00B25	VARIABLE 200K	1	
VR4005		EVMLGGA00B14	VARIABLE 10K	1	
VR4006		EVMLGGA00B14	VARIABLE 10K	1	
VR4007		EVMLGGA00B13	VARIABLE 1K	1	
VR4008		EVMLGGA00B13	VARIABLE 1K	1	
VR4009		EVMLGGA00B53	VARIABLE 5K	1	
VR4010		EVMLGGA00B53	VARIABLE 5K	1	
VR4501		EVMLGGA00B23	VARIABLE 2K	1	
VR4502		EVMLGGA00B54	VARIABLE 50K	1	
VR4503		EVMLGGA00B23	VARIABLE 2K	1	
VR4504		EVMLGGA00B53	VARIABLE 5K	1	
VR4505		EVMLGGA00B15	VARIABLE 100K	1	
VR4506		EVMLGGA00B14	VARIABLE 10K	1	
VR4507		EVMLGGA00B14	VARIABLE 10K	1	
VR6001		EVMLGGA00B14	VARIABLE 10K	1	
VR6002		EVMLGGA00B14	VARIABLE 10K	1	
X2001		VSX0131	CRYSTAL OSCILLATOR	1	<R>
X6001		VSX0086	CRYSTAL OSCILLATOR	1	<R>
			MISCELLANEOUS		
		VJF0190	FUSE HOLDER	6	<!> <R>
		VSC1107	SHIELD CASE (MIDDLE)	1	
		VMZ0851	INSULATION SHEAT	1	
		VSC1776	SHIELD CASE (BOTTOM)	1	
		VSC1780	MIC SHIELD CASE	1	
		VSC2034	SHIELD CASE (MIDDLE)	1	
		VSC2035	SHIELD CASE (BOTTOM)	1	
		VMZ0987	INSULATION SHEAT	1	
	■	VEK3243	JACK PANEL UNIT		PARTS LIST IS
					INCLUDED IN MAIN
					C.B.A. (VEP04177A)
			RESISTORS		
R4751		ERDS2TJ561	CARBON 1/4W 560	1	
R4752		ERDS2TJ561	CARBON 1/4W 560	1	
P4703		VJP1616T	CONNECTOR (MALE) 12P	1	
VR4701		VRV0056	VARIABLE RESISTOR	1	
J4701		VJJ0134	HEADPHONE JACK	1	
			MISCELLANEOUS		
E1		VEJ0501	JACK PANEL UNIT	1	
E2		VGU3046	VR KNOB	1	
E3		VGH1224	JACK PANEL	1	
	■	VEP03385A	VIDEO C.B.A.		
			CAPACITORS		
C3001		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C3002		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C3003		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C3004		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C3006		VCYD1C473MR1	SEMICONDUCTOR 16V 0.047U	1	
C3007		ECEA0JK221	ELECTROLYTIC 6.3V 220U	1	
C3008		ECUX1H391JCN	CHIP 50V 390P	1	
C3009		ECUX1H680JCN	CHIP 50V 68P	1	
C3010		ECUX1H151JCN	CHIP 50V 150P	1	
C3011		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C3012		ECEA0JKS101I	ELECTROLYTIC 6.3V 100U	1	
C3013		VCYD1C473MR1	SEMICONDUCTOR 16V 0.047U	1	
C3014		ECUX1H103KBN	CHIP 50V 0.01U	1	
C3015		ECUX1H103KBN	CHIP 50V 0.01U	1	
C3016		ECUX1H103KBN	CHIP 50V 0.01U	1	
C3017		ECUX1H180KCN	CHIP 50V 18P	1	
C3018		ECUX1H103KBN	CHIP 50V 0.01U	1	
C3019		ECEA1AKS470I	ELECTROLYTIC 10V 47U	1	
C3020		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C3021		ECUX1H470JCN	CHIP 50V 47P	1	
C3022		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C3023		ECUX1H221KBN	CHIP 50V 220P	1	
C3024		ECEA1HKS2R2I	ELECTROLYTIC 50V 2.2U	1	
C3025		ECUX1H103KBN	CHIP 50V 0.01U	1	
C3026		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C3027		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C3028		ECUX1H220JCN	CHIP 50V 22P	1	
C3029		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C3030		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C3031		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C3032		ECEA1AKS330I	ELECTROLYTIC 10V 33U	1	
C3033		ECUX1H680KCN	CHIP 50V 68P	1	
C3034		ECUX1H181KCN	CHIP 50V 180P	1	
C3036		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C3037		ECUX1H220KCN	CHIP 50V 22P	1	
C3038		ECUX1H220KCN	CHIP 50V 22P	1	
C3039		ECUX1H103KBN	CHIP 50V 0.01U	1	
C3040		ECUX1H103KBN	CHIP 50V 0.01U	1	
C3041		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C3042		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C3043		ECUX1H220KCN	CHIP 50V 22P	1	
C3044		ECUX1H220KCN	CHIP 50V 22P	1	
C3045		ECUX1H103KBN	CHIP 50V 0.01U	1	
C3046		ECUX1H103KBN	CHIP 50V 0.01U	1	
C3047		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C3048		ECUX1H221KBN	CHIP 50V 220P	1	
C3049		ECUX1H103KBN	CHIP 50V 0.01U	1	
C3050		ECUX1H103KBN	CHIP 50V 0.01U	1	
C3051		ECUX1H103KBN	CHIP 50V 0.01U	1	
C3052		VCYD1C473MR1	SEMICONDUCTOR 16V 0.047U	1	
C3053		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C3054		ECUX1H080DCN	CHIP 50V 80P	1	
C3055		VCKD1H681JSA	CERAMIC 50V 680	1	
C3056		ECUX1H103KBN	CHIP 50V 0.01U	1	
C3057		ECUX1H151KCN	CHIP 50V 150P	1	
C3058		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C3059		ECUX1H102KBN	CHIP 50V 1000P	1	
C3060		VCYD1C104MR1	SEMICONDUCTOR 16V 0.1U	1	
C3061		VCYD1C104MR1	SEMICONDUCTOR 16V 0.1U	1	
C3062		ECEA1EKS3R3I	ELECTROLYTIC 25V 3.3U	1	
C3063		ECEA1EKS4R7I	ELECTROLYTIC 25V 4.7U	1	
C3064		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C3065		ECEA1HKS2R2I	ELECTROLYTIC 50V 2.2U	1	
C3066		ECEA1EKS3R3I	ELECTROLYTIC 25V 3.3U	1	
C3067		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C3068		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C3069		ECEA0JK221	ELECTROLYTIC 6.3V 220U	1	
C3070		VCYD1C473MR1	SEMICONDUCTOR 16V 0.047U	1	
C3071		ECEA0JKS220	ELECTROLYTIC 6.3V 22U	1	
C3072		ECEA0JK221	ELECTROLYTIC 6.3V 220U	1	
C3073		ECEA0JK221	ELECTROLYTIC 6.3V 220U	1	
C3074		ECEA1AK101	ELECTROLYTIC 10V 100U	1	
C3075		ECEA1AKS330I	ELECTROLYTIC 10V 33U	1	
C3076		ECEA1AKS220I	ELECTROLYTIC 10V 22U	1	
C3077		ECUX1H151KCN	CHIP 50V 150P	1	
C3078		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C3079		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C3080		ECUX1H103KBN	CHIP 50V 0.01U	1	
C3081		ECQV1H104JZ	MYLAR 50V 0.1U	1	
C3082		ECEA0JKS101I	ELECTROLYTIC 6.3V 100U	1	
C3083		ECUX1H100DCN	CHIP 50V 10P	1	
C3084		ECUX1H103KBN	CHIP 50V 0.01U	1	
C3085		ECUX1H151JCN	CHIP 50V 150P	1	
C3086		ECUX1H100DCN	CHIP 50V 10P	1	
C3087		ECEA0JKS101I	ELECTROLYTIC 6.3V 100U	1	
C3090		ECEA502R1	ELECTROLYTIC 50V 0.1U	1	
C3091		ECUX1H103KBN	CHIP 50V 0.01U	1	
C3092		ECUX1H220JCN	CHIP 50V 22P	1	
C3093		ECCF1H080DC	CERAMIC 50V 8P	1	
C3094		ECUX1H100DCN	CHIP 50V 10P	1	
C8001		ECUX1H103KBN	CHIP 50V 0.01U	1	
C8002		ECEA0JKS101I	ELECTROLYTIC 6.3V 100U	1	
C8003		ECQM1H223JV	MYLAR 50V 0.022U	1	
C8005		ECUX1H103KBN	CHIP 50V 0.01U	1	
C8006		ECUX1H103KBN	CHIP 50V 0.01U	1	
C8007		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C8008		ECEA1HKS010	ELECTROLYTIC 50V 1U	1	
C8009		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C8010		ECUX1H030DCN	CHIP 50V 3P	1	
C8011		ECUX1H102KBN	CHIP 50V 1000P	1	
C8012		ECEA0JU102	ELECTROLYTIC 6.3V 1000U	1	
C8013		ECEA1AM330T	ELECTROLYTIC 10V 33U	1	
C8014		ECEA0JKS470	ELECTROLYTIC 6.3V 47U	1	
C8015		VCYD1C473MR1	SEMICONDUCTOR 16V 0.047U	1	
C8016		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C8017		ECEA1HKS2R2I	ELECTROLYTIC 50V 2.2U	1	
C8020		ECQV1H154JZ	MYLAR 50V 0.15U	1	
C8021		ECUX1H103KBN	CHIP 50V 0.01U	1	
C8022		ECUX1E473FN	CHIP 25V 0.047U	1	
C8023		ECUX1E473FN	CHIP 25V 0.047U	1	
C8024		ECCF1H180JC	CERAMIC 50V 18P	1	
C8025		ECCF1H471J	CERAMIC 50V 470P	1	
D3001		MA151K	DIODE	1	<R>
D3002		MA151K	DIODE	1	<R>
D8001		MA151K	DIODE	1	<R>
D8002		MA151K	DIODE	1	<R>
D8003		MA151WK	DIODE	1	<R>
DL3001		VLD0065	DELAY LINE	1	<R>
DL8001		VLD0064	DELAY LINE	1	<R>
FL3001		VLF0312	FILTER	1	
FL3002		ELB4L025	FILTER	1	
FL3003		VLF0287	FILTER	1	
FL3004		VLF0312	FILTER	1	
FL3005		VLF0155	FILTER	1	
FL8001		VLF0313	FILTER	1	
FL8002		VLF0314	FILTER	1	
FL8003		VLF0297	FILTER	1	
FL8005		VLF0326	FILTER	1	
IC3001		VEFY015	FIC	1	<R>
IC3002		M51457AP	IC	1	<R>
IC3003		BA7021	IC	1	<R>
IC3004		VCR0107	IC	1	<R>
IC3005		AN3311K	IC	1	<R>
IC3006		VCR0096	IC	1	<R>
IC8001		VEFC013	FIC	1	<R>
L3001		VLQ0207K101	COIL 100uH	1	
L3002		VLQ0207K680	COIL 68uH	1	
L3003		VLQ0207K150	COIL 15uH	1	
L3004		VLQ0207K150	COIL 15uH	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
L3005		VLQ0207K101	COIL 100uH	1	
L3006		VLQ0207K101	COIL 100uH	1	
L3007		VLQ0207K150	COIL 15uH	1	
L3008		VLQ0207K680	COIL 68uH	1	
L3009		VLQ0207K1R0	COIL 1uH	1	
L3010		VLQ0207K101	COIL 100uH	1	
L3011		VLQ0207K180	COIL 18uH	1	
L3012		VLQ0207K820	COIL 82uH	1	
L3013		VLQ0207K151	COIL 150uH	1	
L3014		VLF0365	FILTER	1	
L3015		VLF0365	FILTER	1	
L3016		VLF0365	FILTER	1	
L3017		VLF0365	FILTER	1	
L3018		VLQ0207K180	COIL 18uH	1	
L3020		VLQ0207K101	COIL 100uH	1	
L3021		VLQ0207K330	COIL 33uH	1	
L3022		VLQ0207K101	COIL 100uH	1	
L3023		VLQ0207K101	COIL 100uH	1	
L3024		VLQ0207K101	COIL 100uH	1	
L3025		VLQ0207K101	COIL 100uH	1	
L3026		VLQ0207K6R8	COIL 6.8uH	1	
L8001		VLQ0207K101	COIL 100uH	1	
L8002		VLQ0207K101	COIL 100uH	1	
L8003		VLQ0207K150	COIL 15uH	1	
L8004		VLQ0207K470	COIL 47uH	1	
L8006		VLQ0207K681	COIL 680uH	1	
L8007		VLQ0207K101	COIL 100uH	1	
L8008		VLQ0207K101	COIL 100uH	1	
L8009		VLQ0207K470	COIL 47uH	1	
L8010		VLQ0207K151	COIL 150uH	1	
P3001		VJP1235T	CONNECTOR(MALE) 8P	1	
P3002		VJP1409	CONNECTOR(MALE)	1	
P3003		VJP1409	CONNECTOR(MALE)	1	
Q3001		2SC2295	TRANSISTOR CHIP	1	(B,C)<R>
Q3002		2SC2295	TRANSISTOR CHIP	1	(B,C)<R>
Q3003		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q3004		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q3005		2SB709	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q3006		2SB709	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q3007		2SC2295	TRANSISTOR CHIP	1	(B,C)<R>
Q3008		2SC2295	TRANSISTOR CHIP	1	(B,C)<R>
Q3009		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q3010		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q3011		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q3012		2SC2295	TRANSISTOR CHIP	1	(B,C)<R>
Q8001		2SB709	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q8002		2SC2295	TRANSISTOR CHIP	1	(B,C)<R>
Q8003		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q8004		2SC2295	TRANSISTOR CHIP	1	(B,C)<R>
Q8005		2SC2295	TRANSISTOR CHIP	1	(B,C)<R>
Q8006		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q8007		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
QR3001		UN2212	TRANSISTOR-RESISTOR	1	<R>
QR3003		UN2213	TRANSISTOR-RESISTOR	1	<R>
QR8001		UN2217	TRANSISTOR-RESISTOR	1	<R>
QR8002		UN2217	TRANSISTOR-RESISTOR	1	<R>
QR8003		UN2213	TRANSISTOR-RESISTOR	1	<R>
QR8004		UN2217	TRANSISTOR-RESISTOR	1	<R>
QR8005		UN1213	TRANSISTOR-RESISTOR	1	<R>
			RESISTORS		
R3001		ERJ6GEYG393	CHIP 1/10W 39K	1	
R3002		ERJ6GEYG393	CHIP 1/10W 39K	1	
R3003		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R3004		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R3005		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R3006		ERJ6GEYG472	CHIP 1/16W 4.7K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R3007		ERJ6GEYG182	CHIP 1/16W 1.8K	1	
R3008		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R3009		ERJ6GEYJ333	CHIP 1/16W 33K	1	
R3010		ERJ6GEYJ123	CHIP 1/16W 12K	1	
R3011		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R3012		ERJ6GEYJ122	CHIP 1/16W 1.2K	1	
R3013		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R3014		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R3015		ERJ6GEYJ823	CHIP 1/16W 82K	1	
R3016		ERJ6GEYJ681	CHIP 1/16W 680	1	
R3017		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R3020		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R3021		ERJ6GEYJ681	CHIP 1/16W 680	1	
R3022		ERJ6GEYJ331	CHIP 1/16W 330	1	
R3023		ERJ6GEYJ333	CHIP 1/16W 33K	1	
R3024		ERJ6GEYJ333	CHIP 1/16W 33K	1	
R3025		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R3026		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R3027		ERJ6GEYJ334	CHIP 1/16W 330K	1	
R3028		ERJ6GEYJ272	CHIP 1/16W 2.7K	1	
R3029		ERJ6GEYJ334	CHIP 1/16W 330K	1	
R3030		ERJ6GEYJ820	CHIP 1/16W 82	1	
R3031		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R3032		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R3033		ERJ6GEYG102	CHIP 1/16W 1K	1	
R3034		ERJ6GEYG750	CHIP 1/10W 75	1	
R3035		ERJ6GEYG102	CHIP 1/16W 1K	1	
R3036		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R3037		ERJ6GEYJ471	CHIP 1/16W 470	1	
R3038		ERDS2TJ1R0	CARBON 1/4W 1.0	1	
R3039		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R3040		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R3041		ERJ6GEYJ122	CHIP 1/16W 1.2K	1	
R3042		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R3043		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R3044		ERJ6GEYJ331	CHIP 1/16W 330	1	
R3045		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R3046		ERJ6GEYJ393	CHIP 1/16W 39K	1	
R3047		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R3048		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R3049		ERJ6GEYJ684	CHIP 1/16W 680K	1	
R3050		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R3051		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R3052		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R3053		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R3054		ERJ6GEYJ153	CHIP 1/16W 15K	1	
R3055		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R3056		ERJ6GEYJ151	CHIP 1/16W 150	1	
R3057		ERJ6GEYJ561	CHIP 1/16W 560	1	
R3058		ERJ6GEYJ123	CHIP 1/16W 12K	1	
R3059		ERJ6GEYJ820	CHIP 1/16W 82	1	
R3060		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R3061		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R3062		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R3063		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R3064		ERJ6GEYJ561	CHIP 1/16W 560	1	
R3065		ERJ6GEYJ681	CHIP 1/16W 680	1	
R3066		ERJ6GEYJ561	CHIP 1/16W 560	1	
R3067		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R3068		ERJ6GEYJ821	CHIP 1/16W 820	1	
R3069		ERJ6GEYJ821	CHIP 1/16W 820	1	
R3070		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R3071		ERJ6GEYJ152	CHIP 1/16W 1.5K	1	
R3075		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R3076		ERDS2TJ822	CARBON 1/4W 8.2K	1	
R8001		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R8002		ERJ6GEYJ822	CHIP 1/16W 8.2K	1	
R8003		ERJ6GEYJ562	CHIP 1/16W 5.6K	1	
R8004		ERJ6GEYJ105	CHIP 1/16W 1M	1	
R8005		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R8006		ERJ6GEYJ561	CHIP 1/16W 560	1	
R8007		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R8008		ERJ6GEYJ332	CHIP 1/16W 3.3K	1	
R8009		ERJ6GEYJ333	CHIP 1/16W 33K	1	
R8010		ERJ6GEYJ393	CHIP 1/16W 39K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R8011		ERJ6GEYJ681	CHIP 1/16W 680	1	
R8012		ERJ6GEYJ561	CHIP 1/16W 560	1	
R8013		ERJ6GEYJ271	CHIP 1/16W 270	1	
R8014		ERJ6GEYJ182	CHIP 1/16W 1.8K	1	
R8015		ERJ6GEYJ470	CHIP 1/16W 47	1	
R8016		ERJ6GEYJ273	CHIP 1/16W 27K	1	
R8017		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R8018		ERJ6GEYJ821	CHIP 1/16W 820	1	
R8019		ERJ6GEYJ562	CHIP 1/16W 5.6K	1	
R8020		ERJ6GEYJ562	CHIP 1/16W 5.6K	1	
R8021		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R8022		ERJ6GEYJ821	CHIP 1/16W 820	1	
R8023		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R8024		ERJ6GEYJ151	CHIP 1/16W 150	1	
R8025		ERJ6GEYJ333	CHIP 1/16W 33K	1	
R8026		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R8027		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R8028		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R8029		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R8030		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R8031		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R8032		ERJ6GEYJ122	CHIP 1/16W 1.2K	1	
R8033		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R8034		ERJ6GEYJ123	CHIP 1/16W 12K	1	
R8035		ERJ6GEYJ102	CHIP 1/16W 1K	1	
TH3001		ERTD2FHL102S	THERMISTOR 1K	1	
VR3001		EVMLGGA00B52	VARIABLE 500	1	
VR3002		EVMLGGA00B24	VARIABLE 20K	1	
VR3003		EVMLGGA00B23	VARIABLE 2K	1	
VR3008		EVMLGGA00B22	VARIABLE 200	1	
VR8001		EVMLGGA00B23	VARIABLE 2K	1	
X8001		VSX0132	CRYSTAL OSCILLATOR	1	<R>
			MISCELLANEOUS		
		VSC1107	SHIELD CASE (MIDDLE)	1	
		VMZ0554	INSULATION SHEAT	1	
		VSC1890	SHIELD CASE (BOTTOM)	1	
	■	VEP06338B	FRONT C.B.A.		
			CAPACITORS		
C4208		ECEA1CKS330I	ELECTROLYTIC 16V 33U	1	
C4209		ECSE1VT105Z	TANTALUM 35V 1U	1	
C4210		ECSE1VT105Z	TANTALUM 35V 1U	1	
C4211		ECSE1VT105Z	TANTALUM 35V 1U	1	
C4212		ECSE1VT105Z	TANTALUM 35V 1U	1	
C4213		ECSE1VT105Z	TANTALUM 35V 1U	1	
C4214		ECSE1VT105Z	TANTALUM 35V 1U	1	
C4215		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4216		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4217		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4701		ECEA1CKS470I	ELECTROLYTIC 16V 47U	1	
C4702		ECEA1AKS470I	ELECTROLYTIC 10V 47U	1	
C4703		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4704		ECEA1AKS470I	ELECTROLYTIC 10V 47U	1	
C4705		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4706		ECEA1AKS470I	ELECTROLYTIC 10V 47U	1	
C4707		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
C4708		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4709		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4710		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4711		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4712		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4713		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4714		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C4715		ECEA1AK101I	ELECTROLYTIC 10V 100U	1	
C4716		ECEA1CKS470I	ELECTROLYTIC 16V 47U	1	
C4717		ECUX1H271KCN	CHIP 50V 270P	1	
C4718		ECUX1H271KCN	CHIP 50V 270P	1	
C4719		ECEA1CKS220I	ELECTROLYTIC 16V 22U	1	
C4720		ECCF1H560KC	CERAMIC 50V 56P	1	
C4721		ECCF1H560KC	CERAMIC 50V 56P	1	
C6501		ECUX1H103KBN	CHIP 50V 0.01U	1	
C6502		ECEA1HKS2R2I	ELECTROLYTIC 50V 2.2U	1	
C6503		ECUX1H330JCN	CHIP 50V 33P	1	
C6504		ECUX1H103KBN	CHIP 50V 0.01U	1	
C6505		ECUX1H103KBN	CHIP 50V 0.01U	1	
C6506		ECUX1H103KBN	CHIP 50V 0.01U	1	
C6507		ECUX1H221KBN	CHIP 50V 220P	1	
C6508		ECUX1H122KBN	CHIP 50V 1200P	1	
C6509		ECUX1H153KBN	CHIP 50V 0.015U	1	
C6510		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C6511		ECUX1H103KBN	CHIP 50V 0.01U	1	
C6512		ECUX1H103KBN	CHIP 50V 0.01U	1	
C6513		ECEA1CKS470I	ELECTROLYTIC 16V 47U	1	
C6514		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
D4201		OA90	DIODE	1	<R>
D4202		OA90	DIODE	1	<R>
D4203		OA90	DIODE	1	<R>
D4204		OA90	DIODE	1	<R>
D4205		MA3091H	DIODE	1	<R>
D4206		BG3668S	DIODE	1	<R>
D4701		MA153	DIODE	1	<R>
D6501		HZ4CLL	DIODE	1	<R>
D6502		LN28CALS	LED	1	<R>
D6503		MA151K	DIODE	1	<R>
D6504		HZ3BLL	DIODE	1	<R>
D6505		MA151K	DIODE	1	<R>
D6506		MA151K	DIODE	1	<R>
D6507		MA151K	DIODE	1	<R>
D6508		MA151K	DIODE	1	<R>
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D6512		MA151K	DIODE	1	<R>
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D6514		MA151K	DIODE	1	<R>
D6515		MA151K	DIODE	1	<R>
D6518		LN28CALS	LED	1	<R>
D6520		MA165	DIODE	1	OR 1SS119, 1SS254<R>
D6521		MA153	DIODE	1	<R>
D6522		MA151K	DIODE	1	<R>
D6523		MA151K	DIODE	1	<R>
IC4201		AN6558S	IC	1	<R>
IC4701		NJM4556D	IC	1	<R>
IC4702		AN6558S	IC	1	<R>
IC6501		UPD7503G490	IC	1	<R>
IC6502		MN4069UBS	IC	1	<R>
IC6503		MN4066BS	IC	1	<R>
L4202		VLQEL05F221K	COIL 220UH	1	
P4201		VJP1616T	CONNECTOR(MALE)	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
P4202		VJP1606T	CONNECTOR(MALE)	1	
P4203		VJP1612T	CONNECTOR(MALE)	1	
P4205		VJP1607T	CONNECTOR(MALE)	1	
P4206		VJP1595T	CONNECTOR(MALE) 2P	1	
P4207		VJP1606T	CONNECTOR(MALE)	1	
P4701		VJP1616T	CONNECTOR(MALE)	1	
P6501		VJP1606T	CONNECTOR(MALE)	1	
P6502		VJP1614T	CONNECTOR(MALE)	1	
P6503		VJP1608T	CONNECTOR(MALE)	1	
Q4207		2SD602	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q4701		2SD1328	TRANSISTOR CHIP	1	<R>
Q4702		2SD1328	TRANSISTOR CHIP	1	<R>
Q4703		2SD1328	TRANSISTOR CHIP	1	<R>
Q4704		2SD1328	TRANSISTOR CHIP	1	<R>
Q4705		2SB709	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q6501		2SD638	TRANSISTOR	1	(Q,R,S)<R>
Q6502		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q6503		2SD602	TRANSISTOR CHIP	1	(R,S)<R>
Q6504		2SD602	TRANSISTOR CHIP	1	(R,S)<R>
Q6505		2SD601	TRANSISTOR CHIP	1	(Q,R,S)<R>
Q6506		2SB643	TRANSISTOR	1	(Q,R,S)<R>
QR4201		UN2215	TRANSISTOR-RESISTOR	1	<R>
QR4202		UN2215	TRANSISTOR-RESISTOR	1	<R>
QR6502		UN2214	TRANSISTOR-RESISTOR	1	<R>
QR6503		UN2214	TRANSISTOR-RESISTOR	1	<R>
QR6504		UN2214	TRANSISTOR-RESISTOR	1	<R>
QR6505		UN2214	TRANSISTOR-RESISTOR	1	<R>
QR6506		UN2214	TRANSISTOR-RESISTOR	1	<R>
QR6507		UN2211	TRANSISTOR-RESISTOR	1	<R>
QR6508		UN2213	TRANSISTOR-RESISTOR	1	<R>
QR6509		UN2211	TRANSISTOR-RESISTOR	1	<R>
			RESISTORS		
R4223		ERJ6GEYJ183	CHIP 1/16W 180K	1	
R4224		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4225		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4226		ERJ6GEYJ183	CHIP 1/16W 180K	1	
R4227		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4228		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4229		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4230		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R4231		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4232		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R4233		ERJ6GEYJ562	CHIP 1/16W 5.6K	1	
R4234		ERJ6GEYJ221	CHIP 1/16W 220	1	
R4236		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R4701		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R4702		ERJ6GEYJ470	CHIP 1/16W 47	1	
R4703		ERJ6GEYJ101	CHIP 1/16W 100	1	
R4704		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4705		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R4706		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R4707		ERJ6GEYJ470	CHIP 1/16W 47	1	
R4708		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4709		ERJ6GEYJ101	CHIP 1/16W 100	1	
R4710		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R4711		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R4712		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R4713		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4714		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4719		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R4720		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R4721		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R4722		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4723		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4724		ERJ6GEYJ562	CHIP 1/16W 5.6K	1	
R4725		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R4726		ERJ6GEYJ561	CHIP 1/16W 560	1	
R4727		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R4728		ERJ6GEYJ473	CHIP 1/16W 47K	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
R4729		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R4730		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4731		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R4732		ERJ6GEYJ562	CHIP 1/16W 5.6K	1	
R4733		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R4734		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R4735		ERJ6GEYJ561	CHIP 1/16W 560	1	
R4736		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R4739		ERJ6GEYJ681	CHIP 1/16W 680	1	
R4740		ERJ6GEYJ681	CHIP 1/16W 680	1	
R4741		ERJ6GEYJ473	CHIP 1/16W 47K	1	
R4742		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6501		ERJ6GEYJ222	CHIP 1/16W 2.2K	1	
R6502		ERJ6GEYJ221	CHIP 1/16W 220	1	
R6503		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6504		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6505		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6506		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6507		ERJ6GEYG823	CHIP 1/16W 82K	1	
R6508		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R6509		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6510		ERJ6GEYJ102	CHIP 1/16W 1K	1	
R6511		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6512		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6513		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R6514		ERJ6GEYJ821	CHIP 1/16W 820	1	
R6515		ERJ6GEYJ153	CHIP 1/16W 15K	1	
R6516		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6517		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6518		ERJ6GEYJ221	CHIP 1/16W 220	1	
R6519		ERJ6GEYJ221	CHIP 1/16W 220	1	
R6520		ERJ6GEYJ221	CHIP 1/16W 220	1	
R6521		ERJ6GEYJ221	CHIP 1/16W 220	1	
R6522		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6523		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R6524		ERJ6GEYJ221	CHIP 1/16W 220	1	
R6525		ERJ6GEYJ184	CHIP 1/10W 180K	1	
R6526		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6527		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6528		ERJ6GEYJ104	CHIP 1/16W 100K	1	
R6529		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6530		ERJ6GEYJ124	CHIP 1/16W 120K	1	
R6531		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R6532		ERJ6GEYJ683	CHIP 1/16W 68K	1	
R6533		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6534		ERJ6GEYJ124	CHIP 1/16W 120K	1	
R6535		ERJ6GEYJ271	CHIP 1/16W 270	1	
R6536		ERJ6GEYJ223	CHIP 1/16W 22K	1	
R6537		ERJ6GEYJ271	CHIP 1/16W 270	1	
R6538		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6539		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R6540		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6541		ERJ6GEYJ103	CHIP 1/16W 10K	1	
R6542		ERJ6GEYJ472	CHIP 1/16W 4.7K	1	
R6543		ERJ6GEYJ563	CHIP 1/16W 56K	1	
R6544		ERJ6GEYJ223	CHIP 1/16W 22K	1	
SW4201		ESD14314	SWITCH	1	<R>
SW4204		VSS0153	SWITCH	1	<R>
SW6501		ESD14184	SWITCH	1	<R>
SW6502		ESD14314	SWITCH	1	<R>
SW6503		EVQQS307K	SWITCH	1	<R>
SW6504		VSP0151	SWITCH	1	<R>
SW6505		EVQQSB05G	SWITCH	1	<R>
SW6506		EVQQSB05G	SWITCH	1	<R>
SW6507		EVQQSB05G	SWITCH	1	<R>
SW6508		EVQQSB05G	SWITCH	1	<R>
SW6509		EVQQSB05G	SWITCH	1	<R>
SW6510		EVQQS307K	SWITCH	1	<R>
SW6511		VSP0151	SWITCH	1	<R>
SW6512		EVQQSB05G	SWITCH	1	<R>
SW6513		VSP0151	SWITCH	1	<R>
SW6514		EVQQS307K	SWITCH	1	<R>

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
VR4201		VRV0055	VARIABLE	1	
VR4202		VRV0055	VARIABLE	1	
VR4203		VRV0055	VARIABLE	1	
VR4204		VRV0055	VARIABLE	1	
VR4205		EVMLGGA00B53	VARIABLE 5K	1	
VR4206		EVMLGGA00B53	VARIABLE 5K	1	
VR4207		VRV0057	VARIABLE	1	
VR4208		VRV0057	VARIABLE	1	
			MISCELLANEOUS		
		KL02	LED SPACER	1	
	■	VEP00B67A	FE HEAD C.B.A.		
C1501		ECKF1H4722F	CERAMIC 50V 4700P	1	
C1502		ECEA1CKS100	ELECTROLYTIC 16V 10U	1	
C1503		ECQV1H333JZ	MYLAR 50V 0.033U	1	
C1504		VCYD1C103MR1	SEMICONDUCTOR 16V 0.01U	1	
L1501		VLQEL05F221K	COIL 220uH	1	
Q1503		2SC2603AE2F	TRANSISTOR	1	<R>
R1501		ERDS2TJ333	CARBON 1/4W 33K	1	
		VJP1229T	CONNECTOR (MALE) 2P	1	
	■	VEK2821	REAR FRAME (R) UNIT		
D1501		ESAC82004	DIODE	1	<R>
P1501		VJP1144	CONNECTOR (MALE) 6P	1	
P1502		VJP1230T	CONNECTOR (MALE) 3P	1	
Q1501		2SB947	TRANSISTOR	1	(P,Q,R)<R>
Q1502		2SD1270	TRANSISTOR	1	(P,Q,R)<R>
			MISCELLANEOUS		
E1		VMC0191	GRAUNDING PLATE	1	
E2		N024B	INSULATION TUBE	1	
E3		N017A	MICA PLATE	1	
E4		VJP1885	EXT. DC JACK	1	

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks
E5		VEK2822	CAMERA CONECTOR UNIT	1	
E6		VMD0850	CAMERA TERMINAL	1	
	■	VXA2554	A/C HEAD UNIT		
		ERDS2TJ100	CARBON 1/4W 10	2	
		VJP1244T	CONNECTOR (MALE) 4P	1	
			MISCELLANEOUS		
E1		VSQ0540	DEW SENSOR UNIT	1	<R>
E2		VML1791	A/C HEAD ARM	1	
E3		VBR0098	A/C HEAD	1	<R><M>
E4		VMB0935	AD JUST SPRING	1	
E5		VHD0077	SCREW	1	
E6		VHD0144	SCREW	1	
	■	VXA2550	SOLENOID C.B. UNIT		
			MISCELLANEOUS		
E1		VSJ0066	KEEP SOLENOID	1	<R><!>

Ref.No.		Part No.	Part Name & Description	Pcs	Remarks

V0063

Order No. VRDSS70304

Service Manual

Supplement

Video Product

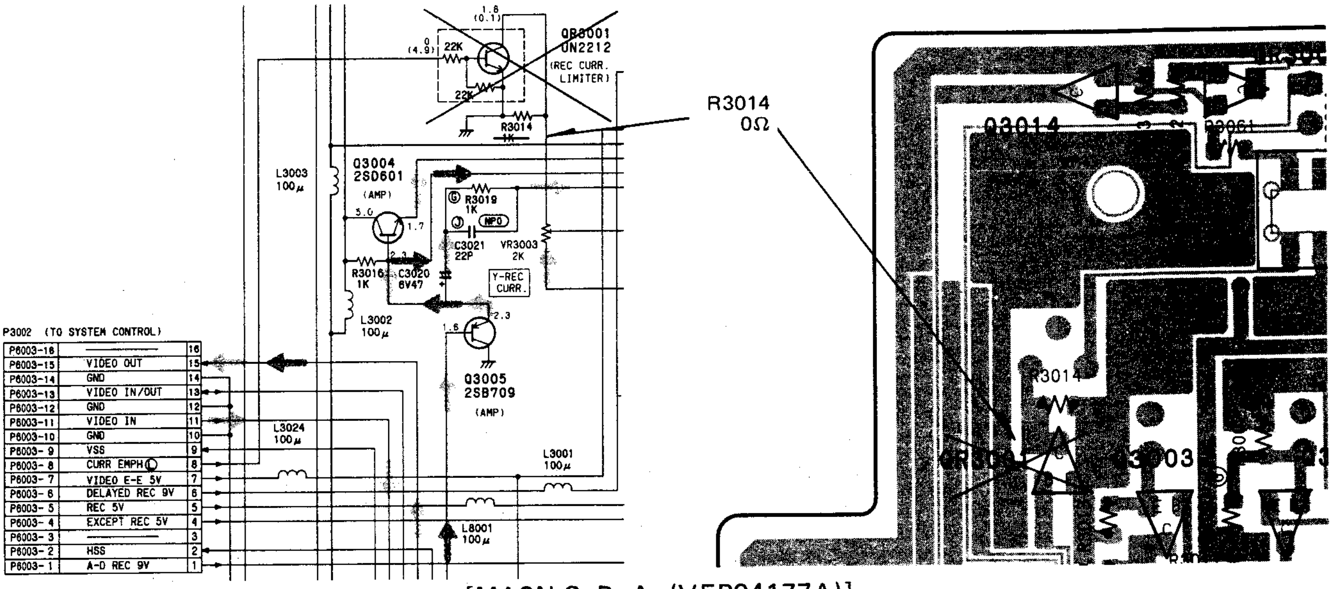
Effective from: First Production

Model No. AG-6400-E/B/EN
AG-6400 Bulletin No. 2

Subject: Correction of Service Manual

Please use this manual together with the Service Manual for Order No. VRD8701201
Model No. AG-6400-E/B/EN

Please correct your service manual as follows:



QR3001
UN2212
(REC CURR. LIMITER)
22K
22K
R3014
R3014
0Ω
Q3004
2SD601
(AMP)
R3019
1K
C3021
22P
VR3003
2K
Y-REC CURR.
R3016
1K
C3020
6V47
L3003
100μ
L3002
100μ
Q3005
2SB709
(AMP)
L3024
100μ
L3001
100μ
L8001
100μ
P3002 (TO SYSTEM CONTROL)
P6003-16
P6003-15 VIDEO OUT
P6003-14 GND
P6003-13 VIDEO IN/OUT
P6003-12 GND
P6003-11 VIDEO IN
P6003-10 GND
P6003-9 VSS
P6003-8 CURR EMPH
P6003-7 VIDEO E-E 5V
P6003-6 DELAYED REC 9V
P6003-5 REC 5V
P6003-4 EXCEPT REC 5V
P6003-3
P6003-2 HSS
P6003-1 A-D REC 9V
Q3014
Q3003
QR3001
R3014

[MA2N C. B. A. (VEP04177A)]

Interchangeability Code See the I/C column on the following Part Number list.

	Parts	Set Production		Parts	Set Production		Parts	Set Production		Parts	Set Production	E	Addition
A	Original	Early	B	Original	Early	C	Original	Early	D	Original	Early	F	Deletion
	New	Late		New	Late		New	Late		New	Late	G	Other

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions		I/C	Remarks
R2052	ERJ6GEYJ394	ERJ6GEYJ334	Chip	330k	G	
R2053	ERJ6GEYJ683	ERJ6GEYJ104	Chip	100k	G	
R2056	ERDS2TJ1RO	ERDS2TJR68	Carbon	0.68	G	
QR3001	UN2212	—	Transistor & Resistor		G	
R3014	ERJ6GEYJ332	ERJ6GEYOROO	Chip	0	G	
78 (2)	VML1200	VXL1200	Tension Arm Unit		G	

Panasonic/National

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Printed in Japan

VC0637 13/11/74 Order No. VSD9107S625

Service Manual

Supplement

Video Product

Subject: Delection of Stopper Boss

Please use this supplement together with the Service Manual as follows:

Model No.	Bulletin No.	Order No.	Effective from
AG-6400-E/B/EN	12	VRD8701201	C0T...

Reason for Change

☐ The following part(s) have(has) been changed for serviceability improvement.
■ The following part(s) have(has) been changed for productivity improvement.
☐ The following part(s) have(has) been changed for standardization purpose.
☐ The following part(s) have(has) been changed for the safety regulation.

Interchangeability Code (I/C)	
A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Other

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
69 (2)	VDB0740	---	STOPPER BOSS	1	E	

Panasonic

Printed in Japan

V00637

! Warning

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advice non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service manual by anyone else could result in serious injury or death.

Order No. VSD9805S215
D1

Service Manual

Supplement

NTSC / PAL Video Product

Subject : Change of Capacitor

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.	Order No.	Effective from
AG-6400-E	15	VRD8701201	'97 Running Change
AG-7450-E/EG	15	VRD8904M615	'97 Running Change
AG-7400-P	18	VRD8710M210	'97 Running Change
AG-7450-P/K	12	VRD8909M236	

Reason for Change

- ☐ The following part(s) has(have) been changed for serviceability improvement.
- ☐ The following part(s) has(have) been changed for productivity improvement.
- ■ The following part(s) has(have) been changed for standardization.
- ☐ The following part(s) has (have) been changed for the safety regulation.
- ☐

Interchangeability Code (I/C)

A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Others

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
C3525	ECSE1VT105ZM	ECST1VB105Z	T.CAPACITOR CH 35V 1U	1	A	FOR AG-7400
C4209	ECSE1VT105ZM	ECST1VB105Z	T.CAPACITOR CH 35V 1U	1	A	FOR AG-6400/7400
C4211	ECSE1VT105ZM	ECST1VB105Z	T.CAPACITOR CH 35V 1U	1	A	FOR AG-6400/7400
C4213-14	ECSE1VT105ZM	ECST1VB105Z	T.CAPACITOR CH 35V 1U	2	A	FOR AG-7400
C1014-16	ECSE1VT105ZM	ECST1VB105Z	T.CAPACITOR CH 35V 1U	3	A	FOR AG-7450
C1033	ECSE1VT105ZM	ECST1VB105Z	T.CAPACITOR CH 35V 1U	1	A	FOR AG-7450

TE2-48

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VC0637

Order No. VRDSS70201

Service Manual

Video Product

Model No. AG-6400-E/B/EN
AG-6400 Bulletin No. 1

Supplement

Effective from: First Production

Subject: Correction of Parts List

Please use this manual together with the Service Manual for Order No. VRD8701201
Model No. AG-6400-E/B/EN

Please correct the following part numbers in the replacement part list.

Interchangeability Code See the I/C column on the following Part Number list.

	Parts	Set Production		Parts	Set Production		Parts	Set Production		Parts	Set Production		
A	Original New	Early Late	B	Original New	Early Late	C	Original New	Early Late	D	Original New	Early Late	E F G	Addition Deletion Other

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	I/C	Remarks
114 (3)	VGP1614	VYF1039	Cassette Cover	G	[R] FOR AG-6400-E/B
114 (3)	VGP1537	VYF0965	Cassette Cover	G	[R] FOR AG-6400-EN

Panasonic / National

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